

**Compact Space: Reconfiguration and Reconsideration of Liliha Neighborhood**

Erin Sim

December 2012

Submitted towards the fulfillment of the requirements for the Doctor of Architecture degree

School of Architecture  
University of Hawai'i

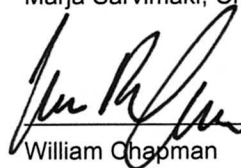
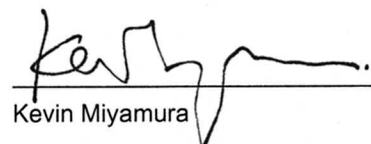
Doctorate Project Committee  
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*We certify that we have read this Doctorate Project and that, in our opinion, it is satisfactory in scope and quality in fulfillment as a Doctorate Project for the degree of Doctor of Architecture in the School of Architecture, University of Hawai'i at Mānoa.*

Doctorate Project Committee

  
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## Abstract

Compact living is a valuable asset to current living standards. With issues of urban sprawl and housing affordability, living more compact is a solution that can benefit many. This project studies different compact living situations and explores the techniques utilized to make compact spaces habitable, comfortable, and valuable in our society. It highlights various multi-functional mechanisms, transformations, and flexibility used in compact living which provides efficient and comfortable means of living.

Evaluating the housing crisis of 2008, the current state of housing costs, affordability, and ownership will begin to illustrate how compact living can become a meaningful solution to today's living standards. Discussing issues of urban sprawl and traffic congestion, integral to our lifestyle patterns, will exhibit the adversarial effect of the causative low-density urban development of Honolulu.

This project will reconsider how density can be increased in low density areas, and will utilize Liliha, Honolulu as the project site. The goal of the design is to utilize elements of compact living to improve housing and urban conditions. It will assess these urban development and zoning conditions, and will study select details of typology. These will be discussed in various maps, diagrams, and drawings which drive the final design of the project.

The design of this project emphasizes the walk-up typology which can be found throughout Liliha neighborhood and Honolulu. It studies the current design of a typical walk-up and reconfigures it, keeping effective elements and eliminating unsuccessful ones. It then applies multi-functional mechanisms, transformations, and flexible elements studied to improve the quality of the living space and the urban fabric.

## 1 Introduction

## Inspiration, Ideas, and Questions

The inspiration of this project materialized from Michael Freeman's book *Space*, which I had the pleasure of reading a few years back. The various space forming mechanisms and arrangements it highlights intrigued and enlightened me—something I was not familiar with—which lead me to further inquire about micro/compact space. In places like Japan, where space is limited, compact living is already a familiar concept. Spaces easily adaptable [to various social and environmental changes], flexible, and versatile were aspects which sparked my interest. It became apparent: the smaller the space was, the more likely these concepts would be used to accommodate for the minimal living area. These concepts contributed to the comfort levels within the space. A small space can be just as comfortable as a large space, if thoughtfully designed with the user in mind. A space should reflect the selective needs of a person. Breaking down the elements of everyday life, and understanding a person's routines and methods can be valuable in informing a design.

I had the opportunity to live and study architecture in Seoul, Korea in the Spring of 2011. The experience was surreal. With a population of 10 million people and a population density surpassing Tokyo, with 44,000 people per square mile, the formation and ramifications of their lifestyle and living arrangements are clearly understood.

Having made little effort to obtain useful information about the culture prior to getting there, I took the advice of a friend and rented myself a *go-shi-won*. I was informed that these living spaces were particularly made for college students studying for the national exam. Students chose to separate themselves from the noise and chaos of their family home and rent one of these rooms for a few months to concentrate on their studies. I decided this was a reasonable option as the price was fairly decent (530,000 won/month equivalent to a little less than \$500 USD), it contained all the necessities (bed, desk, bathroom, heat), and it was a quiet place to study.

When I arrived, the landlady walked me down a dark and narrow hallway. The entire floor was completely silent. The only noise was our movement, footsteps on the wood veneer and the squeak of my suitcase wheels. When she opened the door and turned on the lights, I was surprised to find that I would be living in a shoebox for the next three months.

Roughly 8 feet down and 5 feet across, this room fit a bed, desk, desk chair, refrigerator, closet, toilet, shower, sink, and storage compartments. At first, I was amazed at how this space could contain all of these amenities. But after my initial reaction, an overwhelming feeling of claustrophobia came over me. I could barely fit my two suitcases in the tiny hallway of the room which divided the “bed-space” from the “study-space”.

The first couple of days were rough. However, after trying my best to settle into this pinhole—hanging my clothes in the closet, setting up my study area, and buying a decent pair of sheets—I felt as though this place was starting to become something of my own. I utilized the storage space, putting my edibles into one cabinet, my hair supplies and lotions in another, and using one compartment as a bookshelf. In a way, it all seemed to fit nicer than I expected.

After living there for a few weeks, I settled into a routine to organize my space. Once my space started to show signs of clutter and mess (which didn’t take long) I would force myself to clean, storing any unnecessary objects that were carelessly thrown on the bed or desk. I organized my closet space in the most effective and space-saving way possible, by folding my clothes neatly; which not only fit better in the drawers, but made picking them out much easier. I also made sure that my bed was made every day. I found that having an unmade bed was unsightly and resulted in the room feeling much smaller and cluttered. When I did this, the room felt perceptibly larger...not only larger but cleaner, brighter, healthier, and more conducive to studying. The room was not big and it didn’t take much time to get it to a clean state that satisfied me.



Above: Storage space, desk area and foot of bed next to entrance.

I learned that your living arrangements directly affect your lifestyle. My lifestyle in Seoul is completely different than my lifestyle in Hawaii, and my living arrangements differ just the same. In Hawaii, my room is three times as large as my room in Seoul, but it gets just as messy, just as quickly.

However, because it is bigger, I am less prone to cleaning it as frequently. The size of the mess can be intimidating, leading me to put it off.

I've also noticed several other differences: In Hawaii, I drive an hour to school (roughly 17 miles); whereas in Seoul, I walked 15 minutes and caught a train for 10 minutes to school. In Hawaii, I get up 2 hours before my first class; whereas in Seoul, I got up 45 minutes before my first class. In Hawaii, I eat at home for dinner, most nights, as food can get costly; whereas I ate out almost every night in Seoul due to very affordable food options and no cooking or cleaning. This lead me to question whether it is possible to negotiate a compact type of behavior in a place such as Hawaii where the majority of the island is based off of suburban lifestyles; far different from the compact lifestyles inherent of Asia. Could the conveniences of a dense urban environment entice people to live a more compact life?



## What is Compact Living?

When we think of compact, do we think *small, cramped, tight*? These words relate to the experience of the surrounding space more so than the actual dimensions of a space.<sup>1</sup> If this unproductive perception of compact living can be reconsidered and perceived in a more engaged light, the term *compact* can signify many useful and qualitative features. Compact can be light in terms of construction, the way it sits on the land, cost, and appearance. It can be efficient in use of space and energy bills. It can be flexible in multi-functionality, mechanisms, spatial creativity, and mobility. It can even be helpful to the environment by mitigating urban sprawl, changing consumption patterns, and promoting “smart growth” or the development of healthy communities. The possibilities and value of *compact* are numerous. Altering the perception of this word can improve our living conditions.

The term “compact living” is not limited to *house* and *home*, but rather it includes all aspects of life: working, shopping (consuming), mobilizing, thinking, and organizing. *Compact* is relevant to all scales—an entire cityscape, a building, a living room, or a piece of furniture. Understanding the underlying philosophy of *compact*, and its ability to significantly transform how elements function and how they are perceived is important.

The common notion of space, in the stereotypical American perception, is “bigger” is “better”. The size and area tends to be the selling point of a piece of property, and the larger the space is, the more desirable. This is a significant piece to why the suburbs have been such a desirable place to live, with much more space at a cheaper price than what can be found in the city. As time goes on, the popularity of bigger homes flourishes. According to the National Association of Home builders, homes are growing. In 1970, the average size of a home in the US was 1,400 square feet. In 2009, the average size of a home jumped to 2,700: a 51% increase from roughly 40 years ago.<sup>2</sup>

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<sup>1</sup> Freeman, 6

<sup>2</sup> National Association of Home Builders.

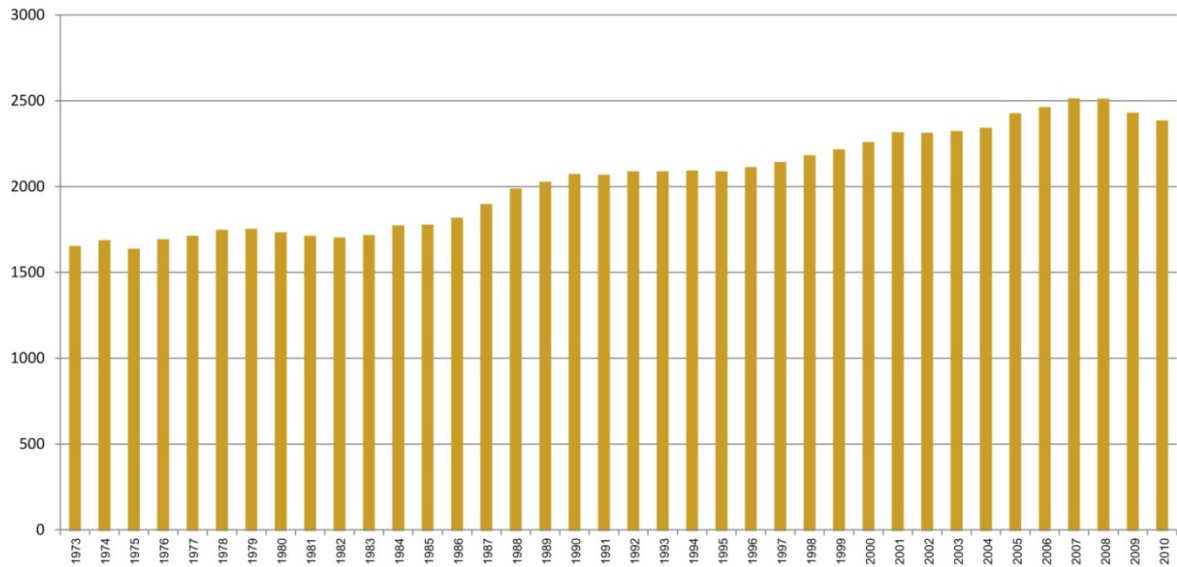


Fig. 1 Average Square Feet of Floor Area in New Single-Family Houses in the US

This project will discuss the perception of space and how we can reform our interests of small spaces. It will look at an array of innovative solutions of compact living that can create more dynamic living arrangements and impart lifestyle changes in a positive and compact way. It will also look at how *quantity* of space can differ from *quality* of space, and how the two do not always correlate as commonly perceived. This project will reevaluate the nature of space and how it is used.

## Project Goals and Context

This project aims to contribute to the existing body of knowledge that examines the fundamental means of living more efficiently, affordably, and healthfully, in regards to lifestyle choices, consumption, and space. All of this can be accomplished without decreasing a person's quality of life. It challenges the American perception of spatial quality and its inherent correlation with size. It will, above all, search for the value in living a compact lifestyle.

This project discusses some of the pressing issues of the housing market burst and how we might better navigate a recovery. It is intended for the next generation of society that will face differing obstacles from today's generation in regard to our financial and lifestyle situations. It is intended for the upcoming generation that might not be living greater than their forefathers. It is also intended to provide solutions by positively change current lifestyle patterns to better fit our changing society and world.

The goals of this project are to identify the qualities of compact living: provide solutions to the existing nature of the living conditions and situations we have currently, find relevance in culturally specific locations that promote compact concepts, and attempt to create or reform universal applications of these concepts by challenging the perception that "bigger is better". This project breaks down living spaces into components to be evaluated on its intended function and quality. It then studies realized functions by the occupant. These studies will redevelop and redesign these components to better fit the practical needs of an occupant. This project also challenges zoning and building codes which discourage the use of compact living environments and promote the growth of urban sprawl.

The nature of this Doctorate Project is defined by design of an urban section of Liliha neighborhood, through research and analysis accumulated. The research documentation of this project includes historic context, cultural context, and social context which have been analyzed by various methodologies.

The historic context analyzes typologies, streets, zoning codes, and mappings of Liliha neighborhood which will be utilized to drive the design portion of the project. Cultural context will be used, namely Japan, analyzing how their culture is reflected in their housing solutions and lifestyle choices, and what can be acquired from their behavior. Social context will be assessed, such as

communal living, cooperatives, and land ownership structures, examining whether this can become a more viable option for affordable, compact living in Honolulu.

The research methods utilized are: case studies essential in supporting the compact philosophy; correlational research, bringing about statistical and contextual data essential in understanding relationships and connections; and historic research, analyzing past events offering explanations to conditional development.

## Site Region

Honolulu uses a single-use zoning system. This means zones are homogenous in the city layout: residential zones are strictly residential, and commercial zones are strictly commercial (with the exception of areas below H-1 Freeway such as Chinatown, Kakaako, and Waikiki which are classified as some type of mixed-use zoning.) Many everyday activities are separated from each other requiring a substantial commute to each activity. The city's infrastructure dictates how the city will function: people living in a residential zone will have to commute to the commercial zone, for work. These zones are spread far apart, making it nearly impossible for most people to walk to work. The car becomes the dominant feature of the city as there is no effective means of public transportation such as rapid transit systems. There is a public bus system run by the City and County of Honolulu which was established in 1971 when the city took public ownership of HRT (Honolulu Rapid Transit, a privately owned company) and branded it: TheBus.<sup>3</sup> However, the usage of TheBus is diminutive when calculating the numbers: private vehicles are used by 82% of Hawaii's population and public transportation (including taxis) is used by 6.3% of the population.<sup>4</sup> Most people opt out of taking TheBus if they can help it. It can take twice as long to get somewhere as it sits in the same traffic as cars but has multiple stops on the way to your destination. The car is the most effective and widely used means of transportation in Honolulu.

However, the car has its own share of challenges. In order to accommodate population growth, Honolulu's urban development follows a branching or sprawling model, as opposed to a contained, densely populated model. It has spread itself outward, attempting to construct a more open atmosphere rather than building more densely within the city. As stated before, this sprawl and single-use zoning forces people to commute to work by vehicle.

Shown in the chart on the next page, is a correlation between homeownership and driving distance to Downtown Honolulu. Most people own homes outside of the city limits: farther east in Hawaii Kai, Kaimuki and Kaneohe, and farther west in the Ewa and Mililani areas.

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<sup>3</sup> Hawaii Directory.

<sup>4</sup> U.S. Census Bureau, Hawaii DP-3. Profile of Selected Economic Characteristics: 2000.

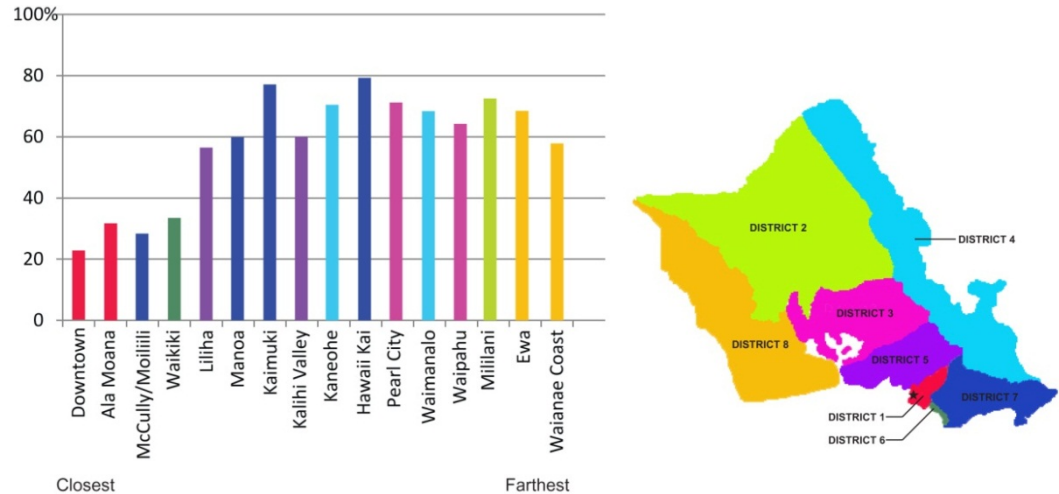


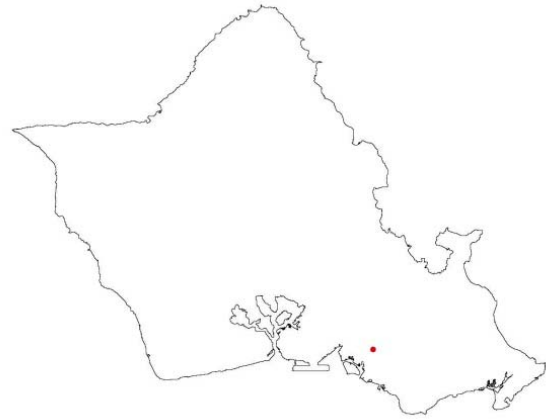
Figure 2: Home Ownership on Oahu (Range in Order of Driving Distance to Honolulu)

This pattern indicates that homeownership is either more affordable, attainable, or desirable, the farther away it is from the downtown area of Honolulu (which is the business district.) This has caused major traffic congestion for roadways during morning and afternoon hours when people drive to and from work (or their destinations.) Also a large factor in traffic congestion on the H-1 freeway (which connects east to west) is student commuters to The University of Hawaii system, with its main location in Manoa, on the east side of Honolulu. Many travel east in the morning hours to school, and west during afternoon hours to home, compounding the traffic congestion.

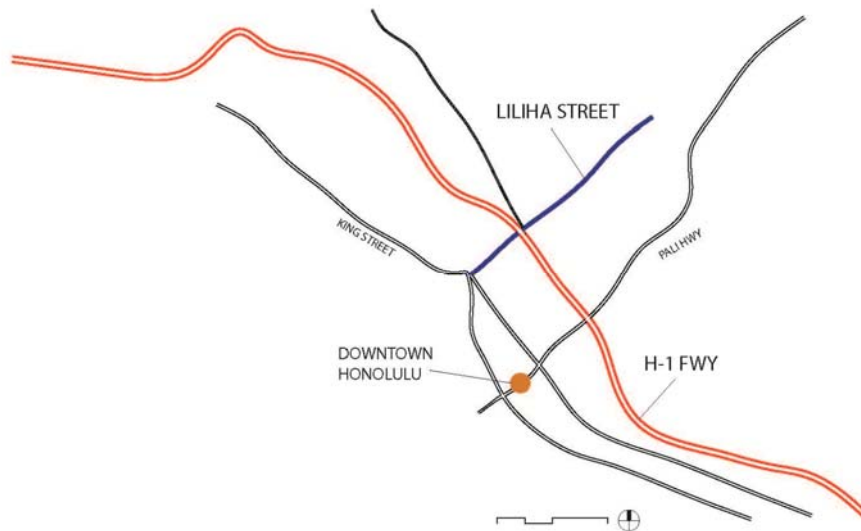
Ewa Gentry (discussed in detail in Chapter 4), a community 20+ miles from downtown Honolulu, is considerably long to commute from, taking on average 1.5 hours of driving time between itself and downtown Honolulu, during peak traffic hours. The largest obstacle is the infamous Fort Weaver Road which can no longer accommodate the increased population caused by the creation of new subdivisions. For many, it is the only access to the H-1 freeway from their subdivision, making it inconvenient and frustrating having to fight traffic daily for several hours.

The district of Liliha on the island of Oahu is the main context of this project. Liliha has an abundance of housing and development opportunities. Located on the northwest end of downtown Honolulu, it has a mixture of quasi-urban and suburban characteristics. It is in close proximity to jobs in the heart of Honolulu, but consists of mostly low residential density.

The H-1 Freeway, which was constructed in the 1960's, put a damper on growth of the Liliha area and has affected the development of the streets and buildings since. A large part of the district consists of timeworn buildings that question the health and safety of the neighborhood, also questioning whether there is something that can improve these qualities.



Location of Liliha neighborhood



Liliha Street and H-1 Freeway

Liliha is less of a destination than it is a transitional corridor used to access the H-1 freeway and major parts of Honolulu. The heavy flow of traffic on and off the H-1 freeway during morning and late afternoon hours does little to help Liliha to be seen as an attractive destination. The area gets extremely hot during the morning and noon hours, with sparse trees and shade along the sidewalks. In some areas, sidewalks are narrow and unaccommodating for foot traffic. The streets are also narrow and overused generating excessive noise pollution. There is a lack of noise buffers as well as physical barriers where cars abut pedestrians.

Prior to the dominance of the automobile in Honolulu, the Honolulu Rapid Transit established the electric streetcar in 1901.<sup>5</sup> Interestingly, “for several decades to come, automobiles were barely a transportation factor, as they were both expensive and unreliable.”<sup>6</sup> This streetcar was a successful feat as it allowed connections to major parts of Honolulu including outer suburban areas. It “closely followed developers and builders. Kalihi, Makiki, Moiliili, Kaimuki, and Manoa all grew up in some part because they were served by HRT&L streetcars.”<sup>7</sup> According to the early maps of transportation lines in 1904<sup>8</sup>, there was a line which connected Wyllie Street, near the north end of Liliha Street, to Pawaa Junction (near Waialae Avenue). This line fed directly through Liliha Street, allowing community members to easily connect to the eastside of Honolulu.

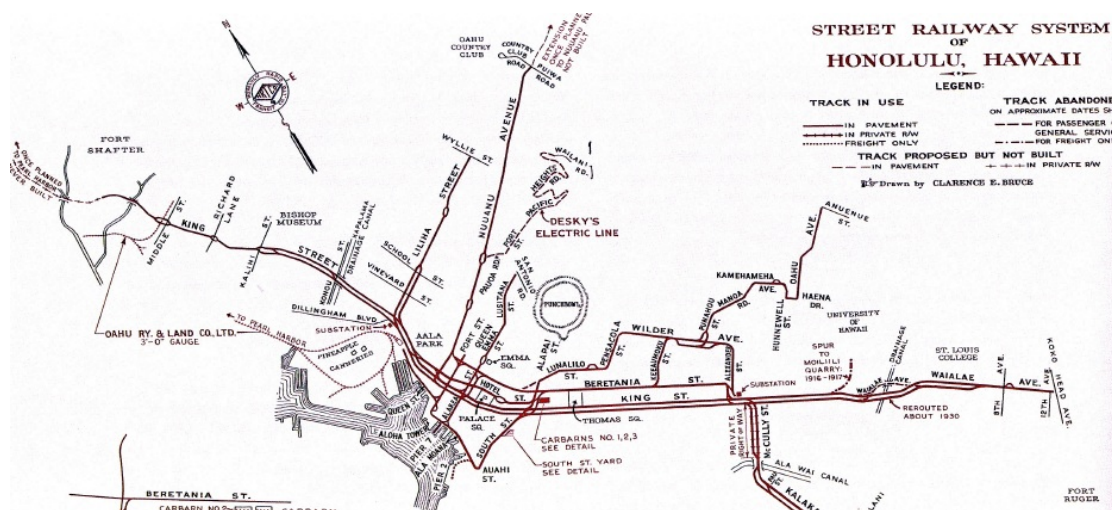


Fig. 3 Map of the rail system

Although successful for roughly 40 years, ridership began to plummet for multiple reasons, most importantly: the introduction of the affordable and increasingly dependable automobile. (By the early 1920s, Model T Fords began appearing in Honolulu at a retail price of \$260, a used one could be purchased for \$10.<sup>9</sup>) This is something more familiar to the current transportation system seen today, with the car as the dominating form of transportation. However, understanding the impact the streetcar had on the development of Honolulu questions whether the streetcar can work once again in this city. Could the streetcar be an alternative transportation system to the automobile, connecting urban nodes

<sup>5</sup> Simpson, 39.

<sup>6</sup> Ibid.

<sup>7</sup> Ibid.

<sup>8</sup> Simpson, 43.

<sup>9</sup> Ibid., 112.



and allowing for an easy, quick method of getting from one place to another? Could it be an answer to traffic congestion or limited parking? For areas such as Liliha where density can be increased, the streetcar can supplement a lifestyle that does not rely so heavily on the automobile.

The atmosphere and scale of Liliha is also an important factor when assessing context. Liliha is relatively small with various 1-2 story commercial and residential buildings. A few larger commercial buildings have been built but the most prominent is the Kuakini hospital, about 10 stories. Besides a McDonalds (at the corner of School and Liliha Street), a Pizza Hut, and a Longs Drugs (at the corner of Kuakini and Liliha Street), Liliha does not have large corporate restaurants or shops. Most shops are very small and some have been there for generations. The prominence of the Medical building on the Liliha neighborhood skyline is shown below among the low rise buildings.



Liliha neighborhood consists of several civic buildings including a Korean church and a Japanese church, a slew of small mom and pop shops scattered along Liliha Street, prominent medical centers, an automotive repair shop, and Liliha Bakery—a very popular bakery island-wide which serves as a distinguishing factor of the neighborhood itself. The bakery has been around since the 1950's and serves up fresh pastries and cakes to their customers—most famous and notable are their coco puffs: light pastries filled with chocolate pudding and topped off with Chantilly frosting. The bakery is divided into two sections. The second section is a linear diner with barstool seating which gets considerably crowded during weekend mornings and nights.



L to R: Liliha Bakery, the Korean Church, and a row of mom retail shops along Liliha Street.

The neighborhood functions fine yet appears lifeless because of the multiple unspectacular buildings. Among the various unspectacular buildings in Liliha are vacant buildings that have not been occupied for years. Also in the urban fabric are pockets of vacant land. There are potential ways to transform parts of the Liliha neighborhood into an economic and desirable alternative for the existing community and new inhabitants, adding depth to the urban form and catalyzing an improvement in vacancies and undesirable spaces. The two images, below left, were taken in 2008. The image, below right, shows the same vacant buildings in 2011.



Most of the residential buildings in this area are low to moderate density single-family homes and walk-up apartments. There are also a few “court” developments that can be found consisting of multiple units on one lot, and a few shop/houses lining Liliha Street and North School Street.

For the most part, Liliha is fairly balanced in its age distribution and can be considered a multi-generational community. However, there is a larger elderly population with 25% over the age of 65.<sup>10</sup> (In Honolulu County, only 15% are over the age of 65.<sup>11</sup>) It is likely that the multiple nursing homes and

<sup>10</sup> Zillow.

<sup>11</sup> U.S. Census Bureau, Honolulu County QuickFacts from the US Census Bureau.

hospitals in Liliha have attracted the large number of older generations for easy access to medical services.

Many people who do own homes in Liliha are without children: 66%.<sup>12</sup> This indicates children have either grown up and moved out (older generation), or there are no children in a household (single or married with no children). Those who are single account for 30% of the population and those married account for the majority: 50.1%.<sup>13</sup>

70% of the population of Liliha is ethnically Asian, with 25% Chinese and 23% Japanese.<sup>14</sup> This can be attributed to its close proximity to Chinatown, where the south end of Liliha Street feeds into. The first Chinese immigrants to Hawaii arrived in 1788; however the first substantial immigration occurred during 1852 to 1876, when 3,908 Chinese contract laborers were brought to Hawaii to work on the plantations.<sup>15</sup> Once plantation work started to decline, in 1884, the Chinese found work enterprising and starting up private businesses, concentrated in the Chinatown area.<sup>16</sup> The Chinese population extended out and up Liliha Street and can account for the numerous Chinese owned restaurants, businesses, and buildings that line the street below the freeway. More so, the live/work shophouse type found in Liliha neighborhood could have been stimulated by the Chinatown shophouse type.

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<sup>12</sup> Zillow.

<sup>13</sup> Ibid.

<sup>14</sup> Hawaii.gov

<sup>15</sup> Honolulu's Chinatown.

<sup>16</sup> Ibid.

## 2     Housing Issues

## Affordability and Quality

There is a small minority of people that actually own their own home in North America, whether they have inherited the property or have some type of uncommon wealth.<sup>17</sup> But the vast majority of us that do not have this type of luxury must work hard to attain the American dream, and in today's conventions that means spending close to a lifetime to achieve it. Housing prices have inflated to roughly 4 times what they were in 1940. This makes housing so unaffordable that most people do not expect to own the house without taking out a twenty or thirty year mortgage. This means you must pay roughly two to three times the stated cost over that 20 to 30 year period.<sup>18</sup>

Those who refuse to do this take matters into their own hands and build what they can afford, which means building very small and using little resources. A shocking precedence comes from the 130 square foot house. With a cost of \$500 for construction and utilities costing less than \$20 a month, it is hard to grasp the reality that this houses two people comfortably. With no excess or extras, and just the right amount of details, this home has character that represents the lifestyles of its users well. The owner of the house insists that "...it all has to do with feelings, attitude, and spirit...things that you can't quantify".<sup>19</sup>

Although the affordability of a house has obvious importance, compact living should not be limited to the impression that smaller is always more affordable, thus superior. Taking a different perspective on the concept, what is more appealing: A large but very affordable space? Or a small but fairly expensive space? Most of us would clearly gravitate toward the affordable large space. However, we can assume that the cost of a space has several contributing factors. Besides the size of a space—location, construction, materials, and details all play their part in determining the cost of a space. Details can be any specific part of a building, from the circulation, to the material choice, to the doorknob selection. They work how you want them to work or in this case, how you pay for them to work. So in a way, the quality of space is significant in how a space is perceived and experienced. According to Brown, "A well-designed small house that has been carefully thought out and built as a matter of

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<sup>17</sup> Soloman, 55.

<sup>18</sup> Ibid, 56.

<sup>19</sup> Ibid, 51.

conscious choice in the face of alternatives is neither poor nor substandard.”<sup>20</sup> This means that a small space with a lot of work put into defining that space with detail and reflection of personal style may then hold a lot of character and make the user feel comfortable and at ease. The character of a space is often defined by the details.<sup>21</sup>

When working with a small square footage, architects rely on their ingenuity in design ideas to make the space function as it should and be aesthetically pleasing. As stated by Duo Dickenson, “To reduce [a house’s] size and maintain its desirability, the small house must be a thoughtfully designed, thoroughly efficient building, containing the appointments and amenities that foster pride in ownership.”<sup>22</sup> There are certain values that these compact houses hold. They work off of efficiency, cleverness, sensitivity, and this then eliminates excessive elements.<sup>23</sup> What are left are the basic functions, which some could argue is all you need. They incorporate clever tricks that rely on solutions that will fulfill a bunch of needs at once.<sup>24</sup> This is important because the design solutions must be well thought out and to the point as there is literally no room for any extras.

However, in many cases, space is, more often than not, assessed in terms of its size.<sup>25</sup> The square footage of a space tends to be the most quantitative value to a piece of property. It is the simplest way to evaluate space objectively. But, as said before, the quality of the space should depend on the actual experience one has in the space. But this mentality of space tends to branch off of our cultural experiences.<sup>26</sup> Hence, the American idea of “bigger is better” encourages us to live “large” which is conversely differing from the Japanese architectural philosophy of minimalist living.

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<sup>20</sup> Brown, 9.

<sup>21</sup> Ibid, 9.

<sup>22</sup> Dickenson, 6.

<sup>23</sup> Freeman, 7.

<sup>24</sup> Valle, 9.

<sup>25</sup> Freeman, 6.

<sup>26</sup> Ibid, 6.

## Housing Crisis

Currently, we are still suffering from the economic crash of 2008, some cities more than others. Jobs have been lost, businesses have been bankrupted, and homeowners have been displaced. With the housing crash, there has been a massive home devaluation throughout the country and “many are starting to owe more on their mortgages than their homes are worth”.<sup>27</sup> Statistically speaking, about 11.1 million or 23.1% of all mortgaged homes went underwater in October of 2010.<sup>28</sup> If this trend continues, “strategic defaults could both accelerate the pace of the home foreclosures and also make it harder for new borrowers to obtain mortgages.”<sup>29</sup>

This creates a problem, not only for the economy, as people start to abandon their homes and mortgages, but also for the well-being of our communities and social structures that are intended to promote positive growth. The question that then comes into context is whether or not it is possible to unchain ourselves from the mentality of wealth equaling large house, large price, and thus, large mortgage. If truth be told, homeowners are technically not homeowners at all. If a mortgage is not paid off, the home is not rightfully yours. Technically, you are a *mortgage-owner*, because “what you own is the mortgage, not the house.”<sup>30</sup>

The increase in home ownership leading up to the 2008 housing bubble burst can be attributed to the generous subprime mortgage lending from banks. These adjustable rate mortgages, although enticing for its low initial interest rates, really fell short in providing its borrowers a safe and stable way of paying for their home. The risks of these types of mortgages were unseen and unexpected. It was predicted that the housing market would continue to climb which meant potential lower interest rates following the initial low-fixed rate. However, “homeowners who fail to see an increased income as interest rates, and monthly payments, rise may find it difficult to make each month's mortgage payment”,<sup>31</sup> which undoubtedly and unfortunately leads to housing foreclosure.

This swell in housing foreclosures took a toll on the housing market and housing ownership. Many people were left in the dust after the bust of 2008, leaving recently finished spec homes and

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<sup>27</sup> Nasiripour.

<sup>28</sup> Kravitz.

<sup>29</sup> Nasiripour.

<sup>30</sup> Soloman, 2006, 55.

<sup>31</sup> Hartman.

housing developments as ghost towns and neighborhoods. Price levels began dropping as the demand dropped and vacancies rose. Housing ownership was at an all-time high in 2004 when it reached 69% in the United States. But gradually, this percentage began declining to what it is at currently, 66.9% in 2010.<sup>32</sup> The American dream of owning a single-family home began to shatter under the pressures of the economy, and it's now apparent that something must change in order for housing to, once again, be affordable and attainable.

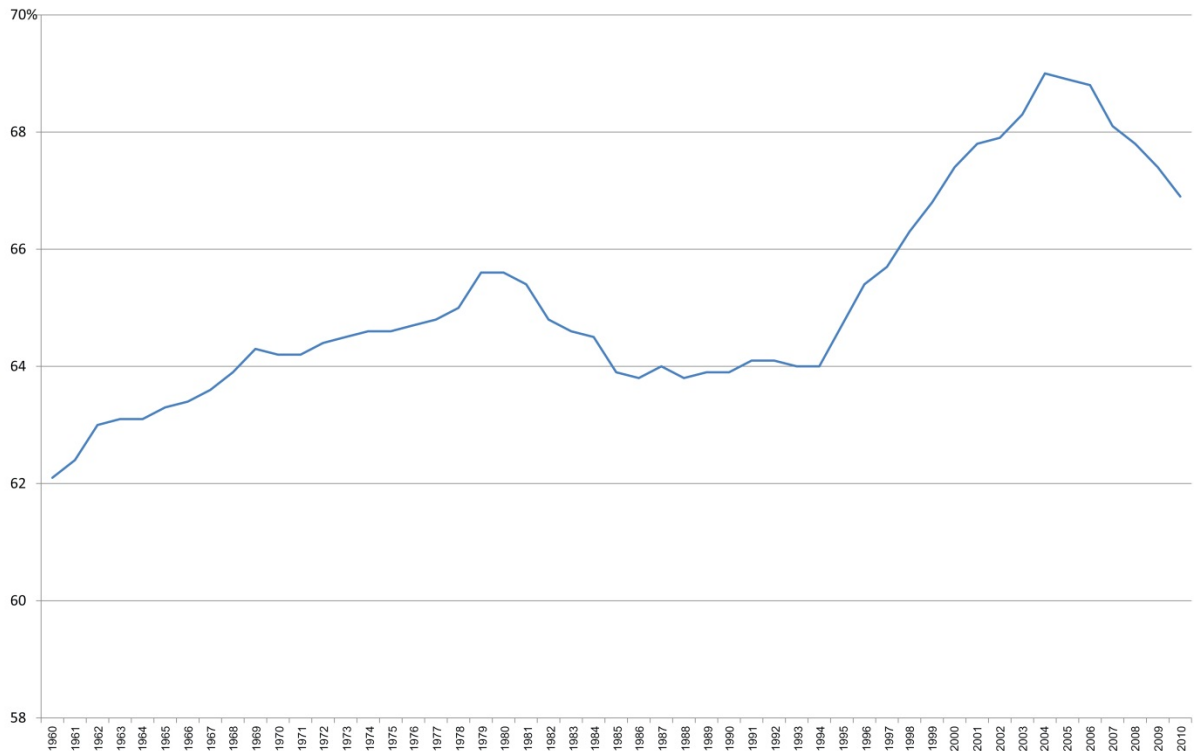


Fig. 4 Homeownership Rate in the US

On September 17, 2011, the Museum of Modern Art PS1 held a workshop and exhibition, *Foreclosed: Rehousing the American Dream*, in which the main topic of concern was the housing crisis and foreclosure of countless suburban units across America. There were five teams involved who were invited to rethink the housing development and related infrastructure and “catalyze urban transformation.”<sup>33</sup> Each team had a specific suburban zone, located within a corridor between two major cities, which they focused on.

<sup>32</sup> US Census Bureau, Housing Vacancies and Home Ownership.

<sup>33</sup> MoMA.



Michael Bell, of Visible Weather, did a study on Temple Terrace, a suburb located near Tampa, Florida which poses questions about density, urban development, and infrastructure. Being roughly 4.5 miles long and consisting of 22,000 people, there are 4.5 people per acre in this city.<sup>34</sup> What can be expected of this type of loose fitted population are questions of efficiency in infrastructure and organization of the city; also, if and how space is being used properly and effectively.

What Bell and his team proposed was affordable living units that were cost effective to build and saved on materials by using tension systems, and a relatively walkable infrastructure spanning 2.2 miles (which is roughly the span of Central Park in New York, and the span of the east end of Ala Wai Boulevard to Ala Moana Shopping Center in Honolulu.) What they were focused on was making the street a more occupiable zone for pedestrian life. Of the existing programs, they were concerned with four types of development: residential, government offices, offices, and retail. Of the residential typology, they suggested courtyard types, bar type, and single resident occupancies. What they found was that the average house size in Florida was 2,500 square feet<sup>35</sup> which they proposed to scale down to 700 square feet. They also proposed to boost the density of the area from 4.5 persons an acre to 40 persons an acre.



Fig. 5 Visible Weather's Temple Terrace proposal

From this increase in density, they imagined a more efficient organization of the city which would promote more walking and less driving, and also produce “forms of privacy that were tangential to other forms of privacy” in which Bell clarifies that privacy doesn't mean isolation but a sensibility of

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<sup>34</sup> Livestream.

<sup>35</sup> Ibid.

knowing where you are in the mix of things<sup>36</sup>. What should be appended to this comment is that the suburbs are a disorderly and disoriented organization to begin with, with dead ends and maze-like configurations that lack any intuitive responsiveness and also the separation of live and work, which makes things inconvenient for any working individual.

Which brings us to the question of zoning: Is it possible to change the zoning regulations on particular land lots which owners could benefit from and also bring value and opportunity to the city and its occupants? But Bell explains that once you change the zoning to change or increase density, you inherently change the land values which directly affects its owners. And depending on whether or not these owners are capable of dealing with land values and property tax fluctuation is an ethical and realistic question that deserves some sensitivity.

Another good question to ponder is where are our property taxes going? Is it going towards repairs or improvements to the current infrastructure of public or civic spaces? Or does it disappear in a dark and echoing abyss, nowhere to be seen again? If we could reduce taxation to more manageable property taxes, there would be less issues pertaining to zoning changes. Due to my lack of knowledge on these legal regulations affecting the rights of land owners, I'd just like to pose the question on whether it is possible to change zoning regulations of particular lots that would benefit the encompassing city and its occupants, while still keeping things affordable and feasible for the land owners? Mainly, is it possible to eliminate single-use zoning, which is a culprit in urban sprawl and traffic congestion and an inconvenience in many everyday activities?

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<sup>36</sup> Livestream.

## Can You Make Housing Less Expensive?

When trying to analyze housing affordability in metro areas, Elliot Eisenberg comes to the conclusion that housing price increases are highly attributable to the government's decision to increase fees.

Any time a local government raises construction costs by increasing the price of a construction permit, a tap fee, a proffer or an impact fee, the cost of building a house in that area rises and affordability is necessarily reduced. Moreover, the increase in the price of the home to the home buyer will generally be more than the increase in the governmental fee...When construction costs rise, other costs such as financing costs and broker commissions rise in tandem.<sup>37</sup>

When these fees are adjusted and raised, the final price of the home will increase roughly 22% from the initial fee.<sup>38</sup> This is one reason why housing prices can rise at such an alarming rate. Other economic factors also play a role in influencing the cost of housing such as changes in demand and inflation. To put it simply, the price of housing can rise when the overall demand for housing is high, and also when housing cost increases but income stays constant.<sup>39</sup>

Considering the breakdown of pricing and construction costs can also give insight to housing affordability. From 1998 to 2009, there has been a 1% rise in building permit fees.<sup>40</sup> (Although it should be noted that the method used for the 2009 survey was altered from previous years.) As stated before, government increase in fees such as permit, tap, and impact fees are a major contributor to housing price increases. Another interesting find is that framing and trusses decreased by 5% from 1998 to 2009 which may not necessarily mean cheaper lumber but could possibly be attributed to a greater distribution of costs throughout the chart list, meaning that other building materials, systems, and fees are increasing.

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<sup>37</sup> Eisenberg.

<sup>38</sup> Ibid.

<sup>39</sup> Ibid.

<sup>40</sup> Emrath.

Below is a chart taken from the National Association of Home Builders which demonstrates the breakdown.

Table 1. SINGLE-FAMILY PRICE AND COST BREAKDOWNS		
2009 National Results		
Average Lot Size:		21,879 sq ft
Average Finished Area:		2,716 sq ft
Sales Price Breakdown	Average	Share of Price
A. Finished Lot Cost (including financing cost)*	\$76,591	20.3%
B. Total Construction Cost	222,511	58.9
C. Financing Cost	6,375	1.7
D. Overhead and General Expenses	20,377	5.4
E. Marketing Cost	5,297	1.4
F. Sales Commission	12,815	3.4
G. Profit	33,658	8.9
<b>Total Sales Price</b>	<b>\$377,624</b>	<b>100.0%</b>
Construction Cost Breakdown	Average	Share of Constr. Cost
Building Permit Fees	\$4,264	1.9%
Impact Fee	3,165	1.4
Water and Sewer Inspection	3,761	1.7
Excavation, Foundation, and Backfill	15,878	7.1
Steel	1,637	0.7
Framing and Trusses	34,805	15.6
Sheathing	3,869	1.7
Windows	6,236	2.8
Exterior Doors	1,930	0.9
Interior Doors and Hardware	3,356	1.5
Stairs	1,676	0.8
Roof Shingles	8,472	3.8
Siding	12,858	5.8
Gutters and Downspouts	949	0.4
Plumbing	11,753	5.3
Electrical Wiring	8,309	3.7
Lighting Fixtures	2,372	1.1
HVAC	8,860	4.0
Insulation	3,332	1.5
Drywall	11,332	5.1
Painting	7,638	3.4
Cabinets and Countertops	12,444	5.6
Appliances	3,583	1.6
Tiles and Carpet	11,436	5.1
Trim Material	7,394	3.3
Landscaping and Sodding	7,088	3.2
Wood Deck or Patio	1,948	0.9
Asphalt Driveway	3,083	1.4
Other	19,085	8.6
<b>Total</b>	<b>\$222,511</b>	<b>100.0%</b>

Source: NAHB 2009 Construction Cost Survey, based on a national sample of 54 home builders

Fig. 6

### 3 Learning From Japan

Similar to Seoul, Japan is at the forefront of compact lifestyles. Similar to Hawaii, it is made up of islands, having a finite amount of land to develop on and limited [to mostly local] resources available. The urban density characteristic of Japan, specifically Tokyo, has developed out of necessity to provide for its citizens in the most efficient and practical way possible. Compacting, subdividing, hybridizing and densifying are all characteristics of the Japanese built environment, as well as adapting: its ability to change (impermanence) and transform quickly and effortlessly—a part of Japanese philosophy. Although the urban development of Japan is based largely on specific circumstances, they have developed behaviors and characteristics, relevant to compact living—a concept that should be thought of as universal.

## Compact Lifestyle

With the less than desirable long commutes by train from the suburbs to the city, people are packing themselves in the smallest spaces imaginable to live closer to Central Tokyo. Despite the already “astronomical land prices, the four prefectures that comprise the Tokyo metropolitan area are among the fastest-growing nationally.”<sup>41</sup> Having access to the top schools and cultural amenities that are located in the metropolitan area takes precedence over the size of living quarters. With this change in living conditions comes a change in lifestyle. Living compactly means adjusting your pattern of life to your space. And in the case of the Japanese, it benefits them in more ways than is given credit for.

This is not to say that we should completely follow in the footsteps of Japan, as they are an entirely different culture than America and much of it does not and cannot apply. However, with this model, we can study how they’ve built their urban fabric around compact and minimalist living and utilize the appropriate elements [such as flexibility, multi-functionality, density and conveniences] to benefit our cities, living, and lifestyles.

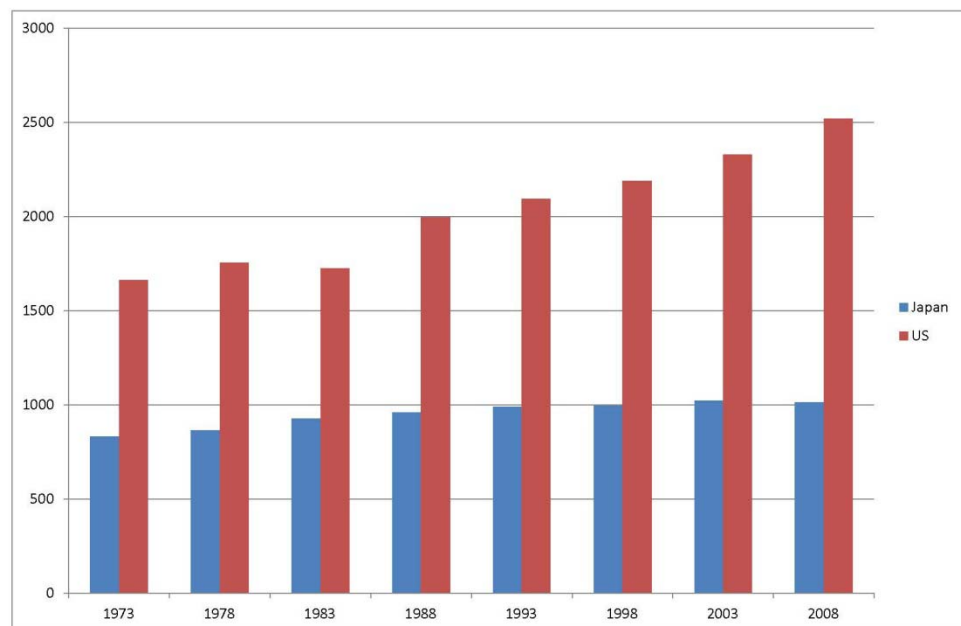
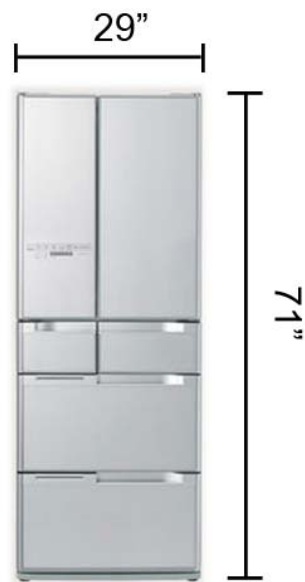


Fig. 7 Comparison of Average Floor Area (Square feet) of Dwellings in Japan and United States

<sup>41</sup> Tashiro, 2007.

Living small can highlight certain positive qualities of lifestyles not normally seen in American styles of living. The Japanese will grocery shop daily as they have a limited amount of space to store their fresh produce. This gives them fresher food and benefits their health. This is a much different mentality from the sizeable (and growing) fully loaded refrigerators our society is used to, which has enough storage capacity to forget the produce that's been bought a month ago. Living small can also be beneficial by encouraging people to spend time outdoors and get fresh air, which differs greatly from the *McMansion* model of having too much indoor space and little outdoor engagement. Private exterior space is important and healthy for occupants.



HITACHI 620L (28" depth)



KENMORE 7201 (35" depth)

Fig. 8 High-end refrigerators, Japanese and American, respectively.

## Pet Architecture and Hybridized Space

Japan (mainly high density cities such as Tokyo) has an abundance of compact spaces due to space being such a limited commodity. Land lots and sites can be microscopically small and sometimes oddly shaped. Building form is largely determined by building codes.<sup>42</sup> Building codes limit the designer from blocking views, light, or overpowering neighboring buildings and gives the designer little freedom in what he can do. However, although these limitations might initially seem like setbacks to the design process, they start to present a new outlook and shape innovative design ideas and concepts that become successful solutions to small living. This type of architecture is termed “pet architecture”, having “pet like characteristics...small humorous and charming” and “existing in the most unexpected places within the Tokyo city limits”.<sup>43</sup> It is said to be the byproduct of urban development and is another example of how the Japanese are able to utilize every inch of space.

There are unexpected surprises in Tokyo that cannot be described as anything more than irrational. An example of this irrationality and ambiguous nature of many buildings is explained by Kaijima who describes a spaghetti shop found in Tokyo:

Wrenched into the space under a baseball batting centre, hanging from a steep incline. Neither Spaghetti shop nor batting centre are unusual in Tokyo, but the packaging of the two together cannot be explained rationally. Despite an apparent convenience in their unity, there is no necessity to hit baseballs towards the opposite hotel, sweat, and then eat at a spaghetti shop.<sup>44</sup>

This strange, unintended configuration has Tokyo full of surprises in its unexpected and unplanned events. However peculiar or unconventional it seems, it is still able to function in everyday life just as well as other European or western cities.

According to Kuroda, “Where cultural interest is low, interest in practical issues is high...what is important is the discovery of how to establish a second role to each environmental element. With this doubling up, it becomes possible to re-use spatial by-products.”<sup>45</sup> The possibility of having third or fourth

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<sup>42</sup> Pollock, 9.

<sup>43</sup> Tokyo Institute of Technology, 1.

<sup>44</sup> Kuroda, 9.

<sup>45</sup> Ibid., 12.



roles to each environmental element could also be considered. The compounding of elements is not only practical but gives us a sense of what is now culturally important, in the Japanese state of mind: practicality. In a sense, they have mastered the art of *killing two birds with one stone* where this efficiency and clever approach to usefulness in built environment and infrastructure has transposed itself to their mentality and routines of daily life.

Another example of this interdependent relationship that Kaijima gives is the sharing of the same structural element between an express way and a department store. The department store relies on the express way's structure and at the same time, the express way relies on the department store for "its validity in such a busy commercial area."<sup>46</sup>

Something very similar to this happens at the Tokyo Station. The Station is made up of several different lines and was the first main rail station connecting Tokyo to the rest of Japan. Once maneuvering out of the station and onto the main road—parallel to the train lines— there are a slew of shops, restaurants and businesses along the street. Although seemingly very conventional and nothing out of the ordinary, taking a closer look would uncover that these shops are embedded into the structure of the JR train line. The structure supporting the tracks is made up of a series of reinforced concrete arches with a brick façade. Under each arch, a void allows the shops occupancy. One arch equal's one shop so all shops are identical in size.



<sup>46</sup> Kuroda, 9.

This interrelationship can be found in many aspects of Japanese architecture and urban life on numerous scales; something big in scale, such as that highway department store, or something smaller in scale, such as the Furniture house by Shigeru Ban, which uses pre-fabricated bookshelves as a structural wall that supports the house and also supplements the design by acting as a space definer.<sup>47</sup> The relationship can even be found in household items and electronics that are used on a daily basis and support the lifestyles of its users.

With density reaching a peak in Tokyo, the Japanese are finding useful and imaginative ways of utilizing one particular aspect of the city in multiple ways. This multi-functionalism becomes an added value, not in terms of finances, but in its uniqueness for being able to provide for its citizens. With this freedom to build, the possibilities are endless. "What is nonetheless respectable about these buildings is that they don't have a speck of fat. What is important right now is constructed in a practical manner by the possible elements of that place. They don't respond to cultural context and history. Their highly economically efficient answers are guided by minimum effort."<sup>48</sup>

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<sup>47</sup> Shigeru Ban Architects.

<sup>48</sup> Kuroda, 12.

## Permeable Space

The way a space is perceived is important when assessing the quality of space. A well-organized space can feel clean and spacious; a cluttered, messy space can feel cramped. Spatial layout is critical in compact living and the way spatial functions are organized can either add to the quality and comfort of an environment or degrade it.

An aspect of both traditional and modern architecture in Japan is the permeability of interior spaces. We are often accustomed to rigidly defined space, where a kitchen will function as a kitchen, a dining room will function as a dining room, and a living room will function as a living room. However, in Japan, especially in compact urban spaces, the lines of functional spaces begin to blur. A kitchen can also act as a dining room, a living room can also act as a bedroom, and a closet can also act as a storage and study space. It becomes a diurnal change in space that displays the epitome of multi-functionalism. With this concept, space is not wasted—it is always in some regular use. It is used in different ways at different times of the day, and rarely is it not used at all.

Examples of this concept are apparent in living spaces we are familiar with such as the studio or loft space. These spaces usually entail one large room which has no fixed or permanent walls dividing the space into specific rooms (except the bathroom). The kitchen, bedroom, living room, study area, dining room, etc., all happen within one large, open space. Although a model like this is efficient, in terms of all functions occurring in one space, there are issues of privacy, if more than one occupant must share the space. More importantly though, there becomes an ambivalence and insensitivity to what the space would really like to be. Furniture is usually fixed and inflexible, leaving the space confused and vague. If we can create flexibility in furniture and appliances, the room itself becomes flexible and a spatial clarity will follow.

Thus, you could say that these Japanese and American spaces can be defined as being *permeable*; however, the word is signifying very different definitions. The Japanese space, as explained above, is blurred by its flexibility, and the American space, as explained above, is blurred by its ambivalence. So how can we start to define space more clearly? We can start very simple: When space needs to be divided or users need privacy, partitions or curtains can start to define and divide space.

Moveable, temporary, and figuratively more transparent than a fixed wall, they are able to define space without being definitive. This type of flexibility keeps space open to the user's needs and interpretation.

The movable partition provides acoustic division and adds more privacy than just visual separation. However depending on the size, it can be bulky and difficult to maneuver. Also less obvious definers of space are changes in elevation. A simple step can indicate a change [in the degree of privacy or program] for a space. No walls, fences, or doors necessary for someone to intuitively understand that the steps leading up to a house are more private than the sidewalk.



Fig. 9 & 10 Houses utilizing the elevations to indicate change in program (left) and privacy (right).

## Empty Space

Emptiness is an important aspect of a successful compact space. Because there is no excess space, there can be no excess materials. Space should be thoughtful where materials are recognized as being important pieces to our lives. These important pieces are awarded a place within our home. If we reassess what is needed, and what we value in our lives, we can transpose these values to what is necessary in our home. We can forego all things unnecessary—keeping our space and our minds clean and organized.

Kenya Hara makes a point about emptiness: ...emptiness doesn't mean 'nothingness' or 'energy-less'; rather, in many cases, it indicates a condition, or *kizen*, which will likely be filled with content in the future.<sup>49</sup> Empty is not about having no meaning or no significance—becoming a sterile and lifeless environment, but about opportunity. If we think about a house filled with a sensory overload of products and materials, we anticipate nothing as everything is displayed in front of us, whether it be relevant to the occupant or not. However, if we get rid of the unnecessary things, and keep the meaningful things, we can mitigate the overload and find our bearings. We can understand the space and what it wants to be and feel more comfortable in it.

The concept of the teahouse is pertinent to the topic of emptiness. Hara notes “when a host invites his guest into his tiny teahouse for an exchange of thoughts, there is a reason for the scant furnishings: one's imagination expands in uncluttered, simple space...Since the humble space contains few concrete objects, our imaginations are freed...”<sup>50</sup> Emptiness promotes freedom: a freedom of the mind to wander and imagine through the vehicle of our senses. If our senses are free of all distractions, we can concentrate with thoughtfulness and imagination and be more productive.

In this regard, “empty” spaces can be beneficial to the health and well-being of occupants. It can promote a clearer thought process, and create a less stressful physical and mental environment. As Brown suggests, the main goal toward “nothingness” is “preserving the sense that one has ample room in which to move about, that all extraneous obstacles that could be perceived even subconsciously as

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<sup>49</sup> Hara, 36.

<sup>50</sup> Ibid., 56.

contributing to a sense of claustrophobia have been, in fact, eliminated.”<sup>51</sup> This is to say that claustrophobia is the antithesis of clean, organized, empty space. Eliminating clutter and keeping organized is crucial in developing a healthy small space.

It is easy to let things get out of control, for things to pile up, and for walls to become hidden behind boxes, stacks of papers, and other miscellaneous goods we may not even remember we had. However, this type of lifestyle, if it is not kept under control, can very easily take over parts of our life and consume our mental health. A cluttered house can develop and manifest into a cluttered mind.

I am incessantly reminded of A&E network’s documentary series, *Hoarders*, in which cameras follow the lives of individuals that suffer from compulsive hoarding. Houses filled to the brim with stuff, all kinds of stuff, anything from trophies, dolls, magazines and newspapers, clothes, obsolete electronic equipment, old and broken furniture, even animals, whether dead or alive. This not only creates an extremely unhealthy and unsafe environment for the human occupants but leaves the animals in neglect and more prone to disease and infection.

What is most relevant is that living in clutter can seriously affect a person’s quality of life, regardless of what types of mental issues they may be dealing with. And it is a mental state which we must be in, to consciously and constantly be aware of how we are living. Keeping our spaces healthy, clean, and organized can only support us in keeping our lives in the same state, and vice versa. How much stuff does one person need?

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<sup>51</sup> Brown, 13.

## Engaging with the Street

Accessibility to the street is important. More importantly, how houses engage with the street can add to the quality of the house. Too often, houses in Honolulu privatize and seal themselves from the outside world. This not only degrades the quality of the street front but also the quality of the living environment. Having engagement with the street promotes healthy attitudes, and new relationships between street, house, occupants, and outsiders. More so, engaging with the street can prove a positive addition to a compact space, namely having healthy access to the outdoors.

Permeability between interior and exterior is exemplified in the concept of the Moriyama House by the Office of Ryue Nishizawa. The engagement with the city is backwards in perspective from what we are accustomed to in most European or Western style cities. The house is intended to open and welcome the street. With its large picture windows, it invites the public to look into the private, putting the interior on display. There is a transparency in this architecture which makes the building feel very light, open, honest, and free. It also changes the character of the street also and brings a different attitude toward streetscape. It attempts to change the ideology of private and public.



Fig. 11, 12, 13 Moriyama House

What is also nice about this housing structure is the lot consists of small studios that can be rented out. It functions as a mini-community that shares ample outdoor garden spaces and alleyways. The architect's intentions were to "create living spaces typical of Tokyo, where life is not enclosed solely within the indoor space but continues from indoors to garden and alleyways."<sup>52</sup> This creates an interaction between community members and also even outsiders. The spatial adjacencies and the circulation paths encourage people to interact with each other, as well as the buildings and outdoor

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<sup>52</sup> Sejima, 158.

environment. Having this communal living veers away from the hermetic lifestyle that many of us are used to, being sealed off from any outside interaction.

After visiting this house during my internship in Japan, I understood that an architect's vision and concept does not always develop exactly how it's imagined, especially when we have no control over how a house will function after it is built. Also, we do not control the occupant's life and needs. With the Moriama house, although conceptually inviting to the street, it may be so that it is too inviting. With a large majority of windows closed with curtains, it is telling that the occupants require more privacy than the house itself can provide. The biggest giveaway was a sign posted at the street asking visitors to have some discretion when taking photos and "gawking" at the house, having consideration for those that live there and in the area. The uncanny popularity of this house could also be a factor in the privacy issues.

These units vary in size and shape and are all designed separately. This variety informs the small gardens and alleyways which become an integral aspect of the design and how the building functions. Each individual is entitled to their own private space but the encouragement with the outdoors and others is obvious. As Henry Shaftoe explains about the nature of us, "humans seem to need both social contacts with others and some access to greenery in order to maintain psychological balance, both being provided by good public spaces. This is presumably why people go mad when held in solitary confinement and why this is used as the cruelest form of punishment."<sup>53</sup>

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<sup>53</sup> Shaftoe, 12.



## Machiya

The Machiya is a Japanese housing typology that originated during the Heian Period in the capital city of the time, Kyoto. This housing type, humble in its construction, aesthetic, and size, was specifically built for commoners as “most urban space in Kyoto was reserved for the houses or official structures of the aristocracy.”<sup>54</sup> Due to the organization of the city mostly planned around the aristocrats and higher classes, the commoners were allotted the leftover spaces to build on, such as dry riverbeds.<sup>55</sup> Also, due to previous taxation being based on the amount of street frontage the building occupied, many of the machiyas were slender in width and reaching in length; this style is called “bed of eels”.<sup>56</sup> (This does partly explain the misshaped and/or narrow lots that comprise most of Tokyo and the denser urban environments in Japan.) The Tokugawa period was also highly influential on the city layout:

...as a result of the extensive urbanization process and the growth of the large cities, the housing density was intensified. As possibilities for the town's expansion outside the city walls were highly limited, the town had to grow inwards within the existing urban blocks.<sup>57</sup>



Traditional machiya in Gion, Kyoto

This then dictated a format for lot division, where “in the land reform urban blocks in large areas in the historic grid-plan area were halved through north-south running narrow streets (*roji*) that were placed in the middle of the urban blocks. The depth of new urban units was 60 meters and the depth of sites 30 meters.”<sup>58</sup>

<sup>54</sup> Suwa, 9.

<sup>55</sup> Ibid.

<sup>56</sup> Coutts.

<sup>57</sup> Salastie 137.

<sup>58</sup> Ibid.

Also an important aspect of the characteristic depth was the possibility to “grow inwards”.<sup>59</sup> The *toriniwa* was an element that developed from this form, which is defined as a “narrow corridor that runs on either side of the house”, that “became an intermediate space between the outdoor space and the interior of the house.”<sup>60</sup>

The urban streets of Kyoto were lively and full of people, gathering, buying, and selling goods. The streets were used as “commercial spaces, temporary residences, theater places, public gathering areas, and so on.”<sup>61</sup> Sachiko Suwa describes the early urban development of Kyoto:

The streets were used as thoroughfares, public areas and sometimes market spaces. From the multiple functions of the street comes the origin of *machiya* space. Originally, common people were not allowed to live in Heian-kyo, so merchants came into the city during the day and set up temporary platforms, stalls or booths to do business on market and festival days. These makeshift structures eventually became huts including small shop spaces.<sup>62</sup>

This description portrays an early example of a type of mixed-use urban development. Many *machiyas*, of this time and later were composed of a store front on the street and a living area in the back. Depending on what the store sold dictated the construction and layout of the spaces. For example, a raised room with tatami mats could signify a kimono merchants shop whereas a stone or earthen floor could indicate a rice or barley shop.<sup>63</sup>

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<sup>59</sup> Salastie 137.

<sup>60</sup> Ibid.

<sup>61</sup> Suwa, 9.

<sup>62</sup> Ibid., 9.

<sup>63</sup> Coutts.

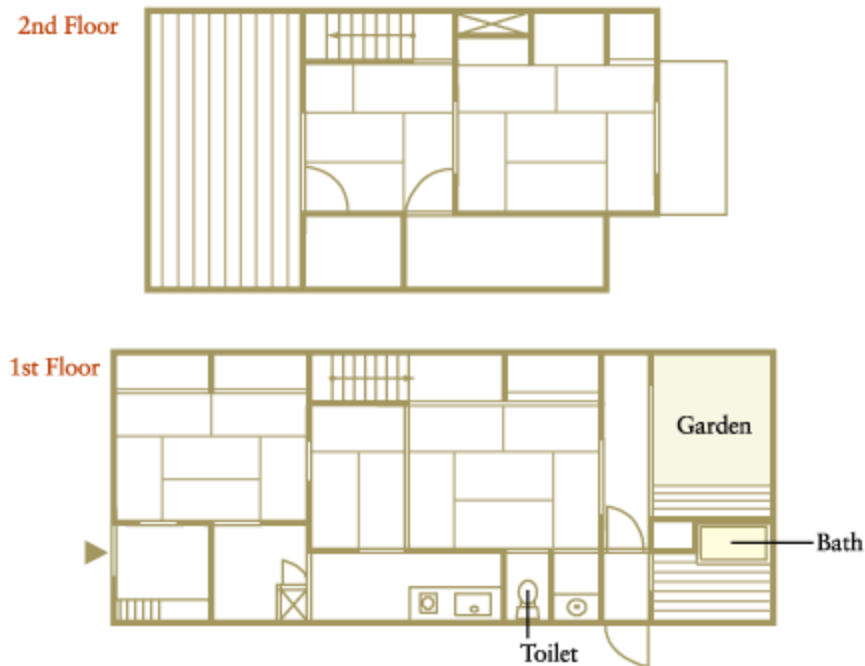


Fig. 14 Typical Kyo-Machiya

Also significant about the machiya is the spatial flexibility that is an inherent quality of many Japanese living arrangements, even today. Many of the rooms were multi-purpose, “with sliding partitions between areas rather than true walls, and a great deal of open space during the day when bedding is put away.”<sup>64</sup> Also, the floor of most rooms was usually comprised of *tatamis*: straw mats of a standard size, which started from the late Edo-period, and was used as a design element, which “rooms are designed to fit...rather than the other way around.”<sup>65</sup> This is also still practiced today and is used as a standard measurement of space in Japan, known as the *tsubo*, which is essentially two tatami mats placed next to each other.

The machiya is an influentially significant typology of traditional Japan and can still be seen and practiced, in contemporary designs, today. These houses are meaningful to the small house ideology as they are efficient in use of space, practical, affordable, and visually distinct.

The machiya format is a shared concept where residents are, in a way, “bound” by their neighbors.<sup>66</sup> This term is not intended to have a negative connotation however, as the idea of sharing

<sup>64</sup> Coutts.

<sup>65</sup> Ibid.

<sup>66</sup> Atelier Bow-Wow, 2010, 251.

can be socially constructive. This gave way to perpetuating the “machiya format and its system of lot division.”<sup>67</sup>

Also, there are distinct generational differences between machiyas. Many buildings in Japan have a short lifespan: the average is said to be less than 20 years (however answers range depending on the source.) There are roughly, up to four generations of machiyas that can be found, possibly more.<sup>68</sup> Many buildings, due to earthquakes, are not usually renovated or remodeled which means they are constantly being rebuilt. When doing a study on the generational differences of machiyas in the Kanazawa area of Japan, Atelier Bow-wow states “it is important to note...joint ownership of lots, and other factors have resulted in modified *machiya* during every era since the machiya format was established. As a result, the *machiya* in Kanazawa lack a consistent, unified appearance.”<sup>69</sup> They go on to say that it is apparent that this evolution “evolved over time as a result of changes in lifestyles, laws, and building typologies. Nonetheless, the space between *machiya* and the treatment of their eaves, which respond to snow accumulation and other environmental conditions, has remained consistent throughout the history of machiya.”<sup>70</sup>

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<sup>67</sup> Atelier Bow-Wow, 2010, 251.

<sup>68</sup> Ibid., 338.

<sup>69</sup> Ibid., 336.

<sup>70</sup> Ibid., 338.

## 4 Dense Environments

## Conveniences

New York is a city with clear physical limits. When building out was not an option anymore, the only way to go was up. As Shay Solomon notes, “The fact is that Manhattan Island has the highest human density of any place in the United States, about 800 times the national average.”<sup>71</sup> What can be said about this fact? People are willing to sacrifice personal/private space to live in a place with conveniences. When people who are willing to share and live communally, it opens the doors to various opportunities. If there is more space that can be utilized publicly, it creates a larger selection of programs, such as restaurants and eateries, coffee shops, markets, museums, and shops. When there is a larger selection, a competitive market works in producing a superior product. Other opportunities include more green space for parks, places for concerts to be held, events, art installations, and places for people to congregate. These components allow a city to come to life.

Hawaii has its own set of conveniences but nothing to the degree of convenience found in New York City. Besides the convenient weather, the most convenient aspect when living in Hawaii is the automobile. Without it, getting around is incredibly difficult. Oahu is a sprawling island, making the commute to Honolulu a tough daily task when living far outside of city limits. Because the density, population, urban development and public infrastructure all differ from New York City, the urban sprawl on Oahu has muted many of the conveniences Honolulu has to offer. As was mentioned on page 17, the street car no longer exists in Hawaii but was a successful type of transportation in the early 1900's. Currently, Oahu is on the edge of installing a 5 billion dollar above-grade rail which would connect the west to the east. It is aimed at mitigating many traffic problems but whether this project will be successful or not is still in debate with countless issues emerging. Without some type of change or intervention happening, population growth and development will only perpetuate this situation.

In New York, you can easily get around with public transportation. Over 50% of New Yorkers use public transportation (excluding a taxi). To put this in perspective, roughly 4% of people in Austin, Texas used public transportation in 2009,<sup>72</sup> and 5.6% of people in Hawaii used public transportation in 2008<sup>73</sup>. The public transportation system of New York, or MTA (Metropolitan Transportation Authority),

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<sup>71</sup> Solomon, 139.

<sup>72</sup> U.S. Census Bureau, Means of Transportation to Work.

<sup>73</sup> Hao.

runs all of the subways and buses in New York City. Although it has some setbacks, especially in the current state of the economy, with union strikes halting service and service cuts, it still serves a great majority of the city by getting people to where they need to go in the most efficient and economical way possible. The bus system is the only option of public transportation on Oahu, at the moment.

Kaijima suggests that “the attraction of urban life is in being able to obtain a level of convenience and comfort similar to inside a room even while outside, through an alliance with infrastructure.”<sup>74</sup> Not having to deal with the stresses of traveling far distances and sitting in traffic during the worst hours of the day to get to your destination, saving money on gas to spend on more enjoyable things in life, seems ideal. So why is it that so many are willing to go through this daily nonsensical routine to live in a larger, isolated house that is 20, 30 minutes...even hours away from the convenience, making it thus, absurdly inconvenient?

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<sup>74</sup> Studio Bow-Wow, 173.

## Public Space

Public spaces are essential to the formulation of a city or healthy urban environment. Especially in dense urban environments, people need outlets from the hustle and bustle and constriction of everyday routines. We can breathe a sigh of relief when stopping by a well-manicured park, full of people picnicking and playing, to enjoy the view and the sun; or appreciate a well-lit open plaza, with restaurants spilling out of their boundaries and temporary open markets attracting an assortment of people creating a lively, entertaining atmosphere. But how are these spaces created? As Shaftoe puts it, “convivial places seem to have grown organically through an accumulation of adaptations and additions.”<sup>75</sup> Soloman resonates a similar note that successful common spaces “require a common sense, from a common history developed slowly by longtime residents who use the space.”<sup>76</sup> Does this mean that the design of successful public space is futile?

As Shaftoe explains, the theories and principles of urban design can be somewhat too mechanistic and rigid with the concept of a master plan that assumes a finality of a project.<sup>77</sup> But realistically speaking, even in terms of a city, nothing is ever concluded as it’s always in a constant state of motion—growing, expanding, and contracting. So what needs to be considered when attempting to design public spaces is the adaptability of the space that can accommodate the changing social structures, density, cultural aspects, and overall development of the place.

When deciphering the differences between public spaces, Kaijima explains that “a commemorative park that was given by the government has a different meaning from a public space that emerged from within. In other words, the differences in the type of relationships between architecture and the individual give rise to various qualities of space.”<sup>78</sup> It’s interesting to point out that not all public spaces are created equal and many spaces function differently than others. But what constitutes the most useful and qualitative aspect of space?

Good public spaces comprise of people. If no one is eager to frequent the public space, who is it there for? The space must be accommodating in ways that are relevant to the persons involved, both

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<sup>75</sup> Shaftoe, 6.

<sup>76</sup> Soloman, 152.

<sup>77</sup> Shaftoe, 81.

<sup>78</sup> Studio Bow-Wow, 8.



culturally and socially, and it should be a place that one feels comfortable in. A successful public space is inclusive and inviting to all people, but safe. It is “one of the few remaining loci where we can encounter difference and learn to understand and tolerate other people.” It can be a learning experience in human interactivity and social behavior.<sup>79</sup>

Soloman gives another valid reason why many public spaces are often left empty: Density. “In some towns, the common space is too spread out, and we just don’t have enough people to fill it up.”<sup>80</sup> Towns and cities lacking adequate population numbers creates a void within the urban fabric. People are thus more willing to stay where they feel comfortable: in the privacy of their own homes. It may not only be a design issue which requires sensitivity, but also an adequate ratio of people involved to fill the space.

Public spaces can acquire a sense of place and become an important feature of a city which the local people can identify with. It can become a cultural experience visitors can enjoy and obtain a better understanding of the underlying society. Places such as New York City’s Central Park, or London’s Hyde Park are outdoor spaces that both locals and visitors use for a variety of different activities. It becomes a mix of different people, events, and scenes throughout the day with degrees of density and openness.

Other examples of culturally important public spaces are open markets such as Seoul’s Namdaemun Market where sellers set up shop in small tents that line the walkway, selling a variety of items from traditional goods, clothing, food, and many local products which portray the essence of Korean culture. These places (although not completely empty and serene) prove to be just as important to the culture and sense of place of a city where both locals and visitors can come to buy goods at reasonable prices. Mongkok’s Ladies Market is another similar example which can be a lively and entertaining experience full of people buying, selling, and bargaining goods. Although this place is geared more towards tourists, it’s apparent that locals still enjoy the entertaining scene as well.

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<sup>79</sup> Shaftoe, 5.

<sup>80</sup> Soloman, 158.



Fig 15. Namdaemun Market in Seoul. Fig. 16 Ladies Market in Hong Kong.

Hawaii has its own interpretation of open markets: Farmers markets are becoming more popular, where consumers are able to buy local and fresh produce grown around the island. These markets are utilizing spaces within walkways of malls, parking lots, and any vacant spaces they can find. It is an excellent way to encourage people to eat healthy and support the local farmers, and it also proves as an excellent way to utilize underutilized spaces.



Fig. 17 Hawaii's Farmers Market

Another type of public space that is not new but apparently becoming very popular (especially in larger cities and urban areas) is the food truck phenomenon. In Portland, it's said that the food truck business has been thriving, with around 450 food trucks around the city.<sup>81</sup> These small, temporary, and portable stations set up along empty parking lot blocks, or anywhere that there is space available, and serve a quick lunch to patrons who are on the go and don't have much time to spend waiting for their meals.

<sup>81</sup> Bluestein.



Portland's food carts lining a parking lot, parking is available in the back

Though small and temporary, when put together on a block, these carts create a lively atmosphere that attracts an array of people who have numerous options from which to choose their lunch. It does wonders for the city itself, creating a cultural identity as “food carts also often illustrate the delicious benefits to a growing ethnically diverse community, as many immigrants own and operate them and make and serve some pretty tasty ethnic specialties.”<sup>82</sup> It becomes a valuable addition to the urban fabric that not only helps small businesses, but also encourages the city dwellers to eat local and provides quick and cheap ways to do it. However, although this proves to be a successful type of urban space, it does sometimes lack the adequate seating and congregating space to enjoy your food (for those not on the go). The experience could be enhanced if these carts could supplement nearby parks and plazas that already have ample free seating, shade, and places to enjoy a leisurely lunch.

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<sup>82</sup> Food Carts Portland.

## Parking

Parking is usually not an issue in suburban areas of Honolulu. Most single family homes are designed with parking space in mind, as policy suggests it by requiring a 10' minimum setback at street front in residential districts. This gives ample space for a driveway into a parking garage which faces directly out to the street on the front face of the building. It also gives the building a very typical appearance. What is disappointing about this configuration is that, although convenient it may be when coming or leaving home (as cars drive on the street and appreciate a trouble-free place to park), the house becomes largely defined by the garage and large driveway which takes away from other aspects of the living space such as front yard space, landscaping, and living spaces that could be more engaging with the street.



Fig. 18 Typical single-family 2-story dwelling in Liliha neighborhood, Honolulu.

Supportive of this design and configuration is the Land Use Ordinance, which states the amount of stalls that are required for residential lots. For a detached dwelling, 2 parking stalls are required, plus



1 for every 1,000 square feet over 2,500 square feet.<sup>83</sup> For multi-family dwellings, 1 stall is required for 600 square feet or less and anything over 800 square feet requires two.<sup>84</sup>

As it is necessary to have street access for cars, the street front makes the most practical sense in parking a car. The reason for having ample private parking space available for each unit is because it supports the use of the automobile. Secondly, it discourages the use of public street parking by providing “safe and convenient access to residences, businesses, public services and places of public assembly” to minimize street congestion and traffic hazards.<sup>85</sup>



Fig. 19 Typical single-family plantation home in Ewa Villages, Hawaii

These houses could be designed with less emphasis on a storage space and more emphasis on a primary living space. An alternative configuration is to have a carport on the side of the house which gives more proportionate street frontage to a front yard, and entrance to the living space.

A customized and clever solution to parking is the Mini House by Atelier Bow-Wow. When a car is present, the house elevation uses the car’s profile as a design element—fitting perfectly under a sub-volume of the house.<sup>86</sup> Although the car sits directly on the front façade, it divides and shares attention

<sup>83</sup> Honolulu.gov, Revised Ordinances of Honolulu, Chapter 21, 111.

<sup>84</sup> Ibid.

<sup>85</sup> Ibid., 109.

<sup>86</sup> Atelier Bow-wow, 2007, 113.

with other design elements of the house. It gives the house an amusing appearance and draws attention to the tiny car under the projecting volume. This strategy informs us of the architect's intentions: to have the car and the volumes work together forming a consciousness of the house's size and sensitivity to streetscape. When the car is not present, we do not see an empty driveway or garage door, we simply see the house. The disappearance of these elements illuminates more important aspects of the design such as the projecting volumes, the material choices, color, and its connection with street and neighbors.



Fig. 20 and 21 Mini House, Tokyo, Japan - Atelier Bow-Wow

Due to the limited amount of space in Japan, the Japanese have established the use of parking machines which stack cars vertically as opposed to laying them out horizontally on a parking lot. These parking machines are used widely throughout the city. They work by automation: A parking attendant operates the machine by storing and retrieving cars by a car elevator. The process is simple, "you pull your car into the platform...the car will be loaded into a conveyer belt parking slot...when you pick your vehicle up, you back out into the center of the circle... That circle is a turntable that will turn your vehicle around allowing you to just drive away without the hassle of backing out onto the street."<sup>87</sup>

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<sup>87</sup> Meiyu Service.

This idea allows valuable land to be used for something other than parking—minimizing the amount of space a parking lot will take up. It supports density and utilizes the attitude of compact by compacting a parking lot. This could become an alternative solution to public parking in Honolulu.



Fig. 22 A typical automated parking lot in Tokyo.

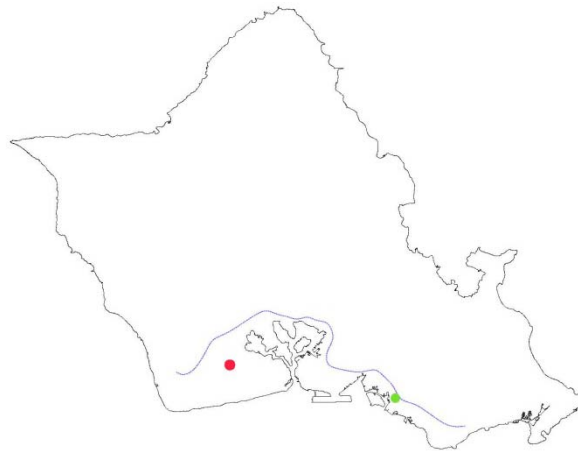
## 5 Land Use and Ownership in Hawaii



## Ewa Villages vs. Ewa Gentry

The plantation house is an early example of housing typology in Hawaii. By the turn of the 20<sup>th</sup> century, the sugar industry started to boom, which “required the importation of over 40,000 workers in a 50-year period”.<sup>88</sup> Easy and affordable-to-construct, housing was needed to accommodate the large number of immigrants. This created small communities of modest-sized plantation homes near the work environment of the plantations.

Many of these communities still exist in agricultural areas in Hawaii.<sup>89</sup> They can be seen around the Ewa district of Oahu, namely the Ewa Villages which was set for historic preservation in 1997.<sup>90</sup> These homes were revitalized, sold back to the community at an affordable price, and put in preservation. The parcels which were deemed uneconomical to rehabilitate was to be sold in clusters to developers.<sup>91</sup> According to Leineweber, “Although many of the plantations in Hawaii are no longer producing sugar, the housing specifically developed for the immigrant workers still remains in many clusters of plantation camps.”<sup>92</sup>



Map showing location of Ewa (in red) the H1 Freeway (in blue) and Honolulu (in green)

In order to provide for communities today, some of these homes have been restored for re-use—housing for employees of businesses or simply affordable housing options. In the case of the Ewa

<sup>88</sup> Leineweber, 36

<sup>89</sup> Ibid.

<sup>90</sup> Honolulu.gov, Management Review of the Ewa Villages Project, 1-3.

<sup>91</sup> Ibid., 1-4.

<sup>92</sup> Leineweber, 36.

Village, the priority was set at ownership for these homes, striving for affordability and something attainable for the working class: Ewa Villages was rehabilitated to allow for “continued existence of the cohesive ‘Ewa community’”, and that “a complex program of subsidized finance and resale has been introduced to allow the sugar workers to gain ownership of their own homes.”<sup>93</sup> It should also be noted that this program had government support and federal funding to bring this to reality.

In comparison to many of the more current constructions and desirable housing in Hawaii, these plantation homes are micro, roughly 22'x24'. The evolution of housing standards of the single-family home in Hawaii is growing excessively larger throughout the years. If we compare the newer constructed homes in Ewa to the Ewa Village houses, we start to see the growth in house size.

A new development, Ewa by Gentry, is close in proximity to Ewa Villages. The Gentry divisions start roughly 1.5 miles southeast of Ewa Villages. The Ewa Gentry is a popular mid-income development which was established in 1988 with the first increment, Soda Creek, near Fort Weaver Road.<sup>94</sup> The approximate size of these particular homes is 1,200 square feet. Throughout the years, newer divisions have been added in the 1990's and 2000's making the entire Ewa by Gentry an accumulation of over 6,800 homes.<sup>95</sup> The development is expected to increase to 10,000 when built out.<sup>96</sup> The newest development, to date, is the Cypress, which also consists of the largest homes to date with an average of 4,500 square feet of living space.<sup>97</sup> The Haleakea division is also one of the newer developments which started in 2006. The 5 different models of tract homes average 3,500 square feet.<sup>98</sup> This is the division I will be focusing on.

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<sup>93</sup> Ibid, 37.

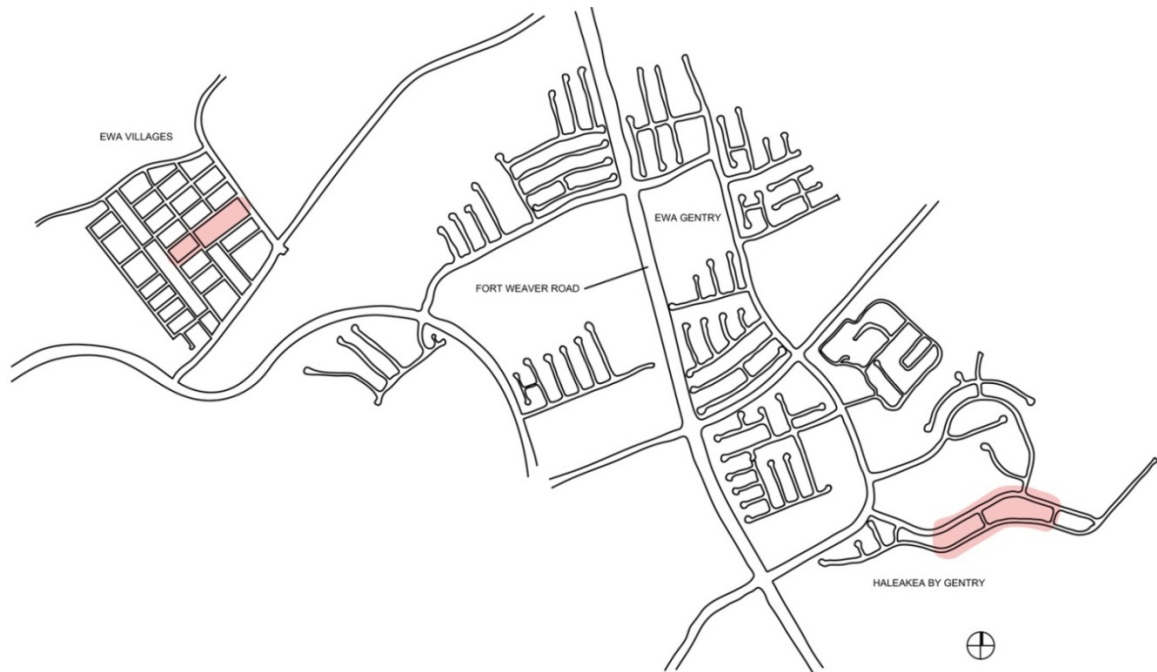
<sup>94</sup> Bates.

<sup>95</sup> Ewa by Gentry Community Association.

<sup>96</sup> Ibid.

<sup>97</sup> Gentry Homes, LTD., Cypress Point by Gentry.

<sup>98</sup> Gentry Homes, LTD., Haleakea.



Map of Ewa Villages and Ewa Gentry. The red indicates sections of each division that will be focused on

If we compare the Ewa Village plot and building size to the Ewa by Gentry Haleakea plot and building size, it clearly shows growth of building size. However, there is no clear sign of growth in lot size. (It may even be possible that the average lot size is shrinking.) This indicates that houses are inching excessively closer to property lines or reaching the limits where building codes specify five foot setbacks on all non-street sides and a 10 foot setback at street-front for most residential properties.<sup>99</sup> Thus, encroaching on the outdoor living space—back, front, and side yards—creating a largely hermetically sealed, (now more typical) air-conditioned/climatically controlled home. The insensitivity to natural and environmental factors is apparent, encouraging the user to interact less with the outdoors and spend majority of time inside the home.

In a sense, this living scheme is opposite of the older, more humble sized homes of Ewa Villages which, when looking in plan, shares more equally—space between inside and out. The layout of the Ewa Village homes is more permeable to environmental elements such as ventilation, breezes, sunlight, as it consists of less obstructions such as outdoor walls or fences, and are also more spread out in plan than the Ewa by Gentry homes.

<sup>99</sup> Honolulu.gov, Revised Ordinances of Honolulu, Chapter 21.

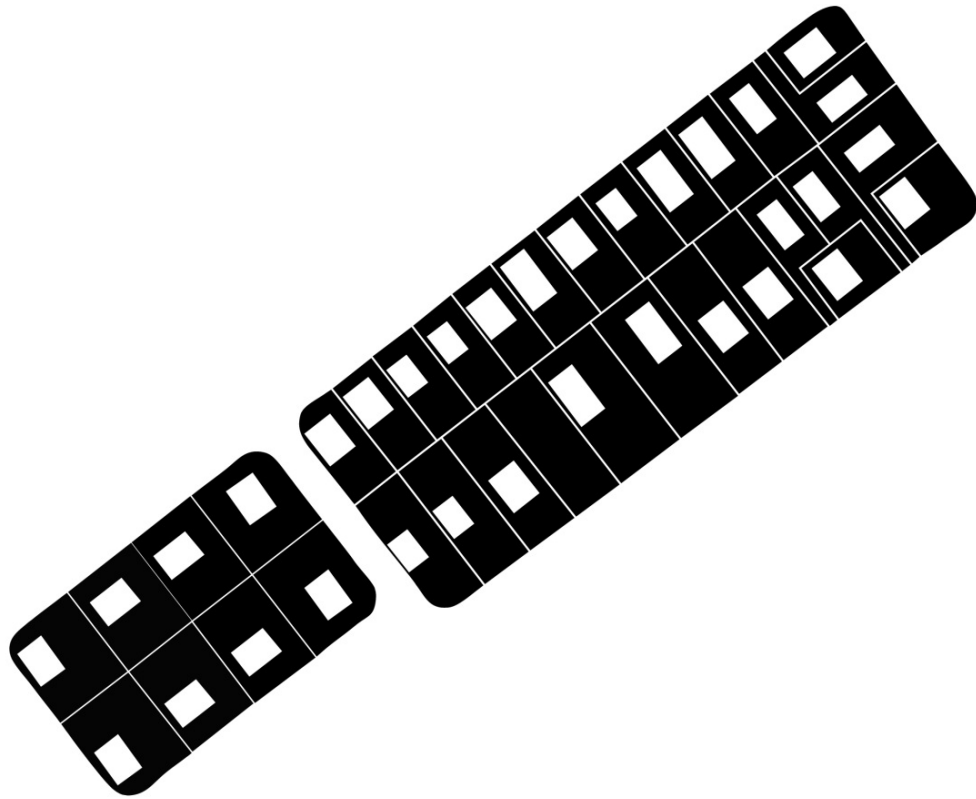


Diagram of a division in the Ewa Village plantation homes

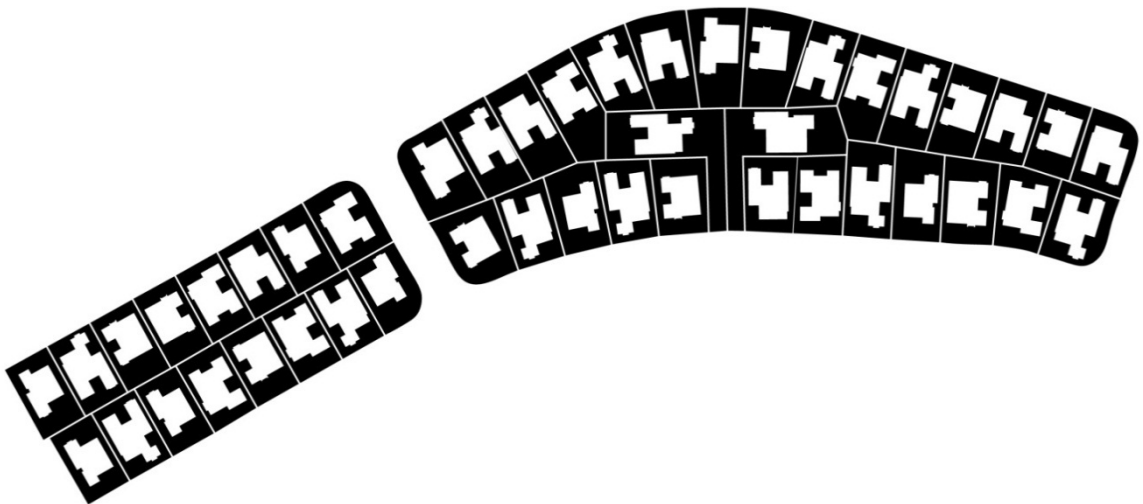
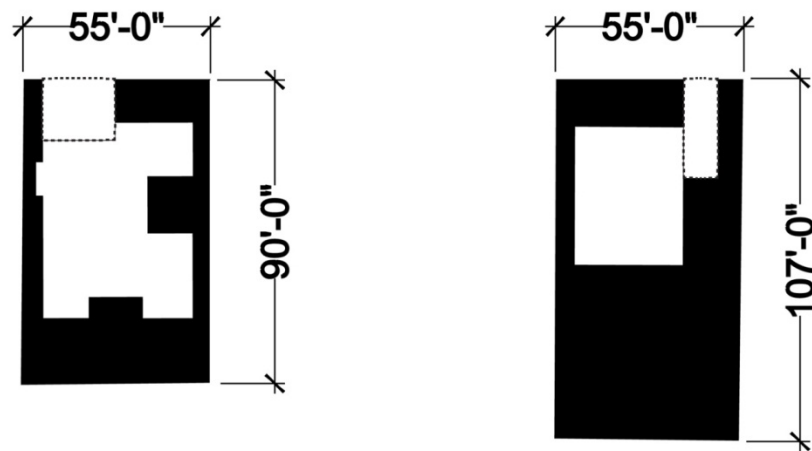


Diagram of a division in the Ewa by Gentry homes

The desire and demand for Gentry homes comes from the American-built dream of owning your own single-family home with a large yard, two car garage, and picket fence. However, the single-family home is turning into a sizeable monster, increasing building density and carport size and decreasing outdoor or yard space (leaving less to garden, play, and relax in.) In a desirable climate such as Hawaii, when did we stop desiring nature and enjoying what it has to offer?



A comparison of a typical Ewa by Gentry Haleakea building : lot ratio (left) and a typical Ewa Villages building : lot ratio (right). Dotted line signifies driveway surface.

## ADUs and Zoning

An accessory dwelling unit (ADU) was popularized in the 1940's, in the U.S., when homeowners would rent out spare apartments or units attached to their homes as a way to earn extra income.<sup>100</sup> These units also inherently aided many housing issues by creating more options for renters, assisting mortgage payments for housing owners. Due to stricter zoning regulations over the years, ADU's have become limited or completely banned in honor of protecting the quality of the single-family neighborhood.<sup>101</sup>

In Washington State, the attitudes toward ADU's are changing, most likely due to the housing crisis and demographic shifts.<sup>102</sup> They are expecting new growth management laws which allow greater housing density and possible de-regulation in areas with stricter regulations that prohibit or have limitations on ADUs.

Substructures of the ADU are the "mother-in-law" or "accessory apartment" which is attached to the main unit and "accessory cottages" or "echo homes" which are detached.<sup>103</sup> As was said before, when rented out, these houses are able to assist in housing issues and create new and affordable housing options for those in need, they also create housing solutions for the older generations who may need assisted living from caretakers, such as their children or family members. However, there have been issues regarding streetscape and neighbors who may find the additions over-bearing in the neighborhood and sometimes an eyesore. Depending on how big the unit is, and how many people are living in the unit, it may start encroaching on other community member's privacy.

Such had been the case with Hawaii's Ohana zoning policy. The Ohana zoning allows an additional attached dwelling to the main dwelling and is meant to provide housing for extended family members. The rules for Ohana dwellings in Chapter 21 of the Land Use Ordinance are as follows:

- (1) The maximum size of an ohana dwelling unit shall not be limited but shall be subject to the maximum building area development standard in the applicable zoning district.
- (2) Ohana dwelling units shall not be permitted on lots within a zero lot line project, cluster housing

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<sup>100</sup> Municipal Research and Services Center of Washington.

<sup>101</sup> Ibid.

<sup>102</sup> Ibid.

<sup>103</sup> Ibid.

project, agricultural cluster, country cluster, planned development housing, R-3.5 zoning districts, or on duplex unit lots.

(3) An ohana dwelling unit shall not be permitted on any nonconforming lot.

**(4) The ohana dwelling unit and the first dwelling shall be located within a single structure, i.e., within the same two-family detached dwelling.**

**(5) The ohana dwelling unit shall be occupied by persons who are related by blood, marriage or adoption to the family residing in the first dwelling. Notwithstanding this provision, ohana dwelling units for which a building permit was obtained before September 10, 1992 are not subject to this restriction and their occupancy by persons other than family members is permitted.**

(6) All other provisions of the zoning district shall apply.

(7) The parking provisions of this chapter applicable at the time the ohana building permit is issued shall apply and the provision of such parking shall be a continuing duty of the owner.

(8) The owner or owners of the lot shall record in the bureau of conveyances of the State of Hawaii, or if the lot is subject to land court registration under HRS Chapter 501, they shall record in the land court, a covenant that neither the owner or owners, nor the heirs, successors or assigns of the owner or owners shall submit the lot or any portion thereof to the condominium property regime established by HRS Chapter 514A. The covenant shall be recorded on a form approved by or provided by the director and may contain such terms as the director deems necessary to ensure its enforceability. The failure of an owner or of an owner's heir, successor or assign to abide by such a covenant shall be deemed a violation of Chapter 21 and be grounds for enforcement of the covenant by the director pursuant to Section 21-2.150, et seq., and shall be grounds for an action by the director to require the owner or owners to remove, pursuant to HRS Section 514A-21, the property from a submission of the lot or any portion thereof to the condominium property regime made in violation of the covenant.<sup>104</sup>

Some of the problems with Ohana zoning are similar to those addressed above on ADU's. Due to the abuse of the Ohana unit program, stricter regulations were created and enforced to discourage homeowners from over-densifying their property. Property owners building an additional unit and then selling it was one issue that arose: What was originally one residential property zoned for single-family dwelling use, would become two separate single-family homes, essentially doubling residential

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<sup>104</sup> Honolulu.gov, Revised Ordinances of Honolulu, Chapter 21, 129.

density.<sup>105</sup> In the past, there have been stops in issuance of permits for Ohana dwellings due to problems such as this and is one of the reasons why stricter limitations have been instated. Since the regulations of 1992, less *legal* Ohana units have been built with most of the permitting occurring between 1982 and 1990.<sup>106</sup> The strict regulations have encouraged people to find alternative, clever ways of building, and creating loopholes to get around the regulations. Now Honolulu is seeing an “increase in the number of illegally built second dwelling units”<sup>107</sup>

There is a need for more affordable housing options with fewer regulations on density. These types of ADU dwellings are allowing homeowners to either create an extra income or supply extra housing for extended family.

Limitation 4 states that the structures must be attached. This has been a regulation since September 10, 1992. Prior to the policy change, homeowners had the option of adding an additional *detached* Ohana dwelling. Abe Lee, a real estate coach, speculates that the change in regulation may have been because “the director of Department of Land Utilization did not like *Ohana*, and this was a way to make it less attractive.”<sup>108</sup> Unfortunately, the regulations, whatever the motive behind them, usually create an enormous monster of a property (for those who actually follow through with the legalities) as there are no size limits to the dwelling anymore. So frequently, the intentions of homeowners are to build as far up and out to the property line as allowed, degrading the quality of the street and neighborhood by looking like intimidating un-cohesive mansions in a humble single-family house neighborhood. In essence, doing exactly what the city has tried so hard to avoid.

Another large problem with this zoning policy is dwellers in the Ohana extension must be related to the property owners. It discourages people from renting out the unit. Also unfortunate, it could have been a great opportunity for property owners to generate extra income to supplement mortgage payments and other necessities or desires. If the city gave the option of increasing density on a piece of property in reasonably regulated terms, by limiting only the size of the units, it would give us: a chance to increase affordable housing (allow renters to lease out small units on their lot), an alternative to the un-cohesive Ohana dwelling mansions, a reduction in urban sprawl (especially for houses close in proximity to the center of the city), and also in turn a reduction to traffic congestion.

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<sup>105</sup> Lau, 3.

<sup>106</sup> Ibid, 5.

<sup>107</sup> Ibid.

<sup>108</sup> Lee.



A few alterations to this policy could drastically improve housing conditions regarding affordability and prosperity while still maintaining tasteful streetscape. Prior to the *Land Use Ordinance*, which was adopted in 1986, there was the *Comprehensive Zoning Code*, effective 1969. Prior to that, there were Revised Ordinances of Honolulu, since the early 1920s. These dates are important in understanding when the city initiated rules and regulations on what is allowed to be built and how. Court developments, which can be found around the Kaimuki, Palolo, and Kalihi areas of Oahu are not allowed to be built today. The Ordinances likely made it difficult to build this type as street access to homes started to dictate how developments were designed.

In the *Comprehensive Zoning Code* (CZC) of 1969, it had already been established that multiple dwelling on a single lot would not be permitted in residential zones with a minimum lot requirement of 10,000 square feet. In the R-3 Residential District section 21-521, it states, "All of the uses and structures permitted in the R-2 residential district shall be permitted in the R-3 Residential district, **except that detached guest houses and servants quarters shall not be allowed, as an accessory use or otherwise.**"<sup>109</sup> Minimum lot area for an R-3 zoned parcel is 10,000 square feet.<sup>110</sup> Minimum lot area for an R-4 zoned parcel is 7,500 square feet.<sup>111</sup> Minimum lot area for an R-7 zoned parcel is 3,500 square feet.<sup>112</sup> (Based on size, an R-7 zone in the CZC could be compared to a current R-3.5 zone that can be found in Liliha neighborhood.) For an R-7 zone in the CZC, it clearly states that "extensions, additions or new districts ...are discouraged."<sup>113</sup> It also states that cluster developments by special permit are not allowed.<sup>114</sup> This means, depending on the Ordinances prior to the 1969 Comprehensive Zoning Code, developing these courts likely became more difficult leading up to its abolishment, on lands smaller than 10,000 square feet. (As seen in the typological, date, and zoning map, located in the site analysis, most of the court typologies were built prior to 1969 and located in the R-3.5 zones.)

These developments consist of multiple, small, sometimes plantation style homes on one parcel. These homes are either communally owned, such as a PUDs (Planned Unit Development) where each unit is owned by its occupant but units share common grounds, or units and land are owned by one entity and units are rented out. What is nice about these developments is it gives occupants a chance to

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<sup>109</sup> Honolulu (Hawaii), 93.

<sup>110</sup> Ibid.

<sup>111</sup> Ibid., 96.

<sup>112</sup> Ibid., 103.

<sup>113</sup> Ibid.

<sup>114</sup> Ibid., 104.

live comfortably in small micro-communities, which is encouraged by the layout of these homes. It consists of a balance between individual private space and communal public space allowing interaction between neighbors, gardening space, and essential outdoor engagement. It should be considered: Maintenance of these homes are important in providing a healthy environment for occupants, and as with any home, it is easy to get into a routine of neglect which affects the quality of the living environment. However, there have been very successful court developments around Honolulu that have been well kept over the years or revitalized. Below are examples of court developments found in Kaimuki.



Why are these housing structures not permitted anymore?

Also included in Chapter 21, is a section on multiple dwelling units in residential districts. The policy states:

**Sec. 21-8.20A Housing--Multiple dwelling units on a single country or residential district zoning lot.**

A maximum of eight dwelling units may be placed on a single zoning lot in a country or residential district, provided:

- (1) The zoning lot shall have a lot area equal to or greater than the required minimum lot size for the underlying country or residential district multiplied by the number of dwelling units on or to be placed on the lot.
- (2) If the applicant wishes to erect additional dwelling units under the provisions of Section 21-8.20, ohana dwellings, the zoning lot shall be subdivided.
- (3) The number of dwelling units contained in each structure shall not be greater than permitted in the applicable zoning district.

(4) This section shall not apply to more than eight dwelling units on a single zoning lot in a country or residential district, which must be processed under the established procedures for cluster housing, planned development housing or subdivision.

(5) For more than two dwellings, the zoning lot shall be located with access to a street or right-of way of sufficient access width as determined by the director to assure public health and safety.<sup>115</sup>

This tells us that we are allowed to build up to a maximum of eight dwellings however, the lot must be 8 times as large as the minimum lot size requirement. For an R-3.5 this is 3,500 times 8, or 28,000. This is highly unlikely a case that you would find an R-3.5 lot this large in urban zones, which makes it nearly impossible for someone to build more than a single dwelling on their lot. So the difficulty in getting beyond these policies is apparent.

Getting back to the rules of an Ohana dwelling, what should also be noted is that the size of the dwelling is not large factor in the development. Rule 1 in section 21-8.20 states:

(1) The maximum size of an ohana dwelling unit shall not be limited but shall be subject to the maximum building area development standard in the applicable zoning district.<sup>116</sup>

As long as we follow the development standard, we are allowed to build as large as we want, to our heart's content. This is confusing as it is stated that the purpose of Ohana dwellings is to "encourage and accommodate extended family living, without substantially altering existing neighborhoods character."<sup>117</sup> What is largely unconsidered and overlooked in these policies, is that people *will* build larger, if the rules permit it. They will build deeper, wider, and taller—stretching a single building to its limits, encroaching on property lines and neighbor's privacy, and spoiling modest streetscape. And this in turn, does substantially start to alter existing neighborhoods character.

Why have the policies permitting multiple smaller detached units been removed? What should be permitted is dividing living spaces and dwellings into separate detached smaller homes that are more likely to preserve landscapes, views, and streetscape diversity and promote greater community living and outdoor engagement.

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<sup>115</sup> Honolulu.gov, Revised Ordinances of Honolulu, Chapter 21, 130.

<sup>116</sup> Ibid, 129.

<sup>117</sup> Ibid.

If these housing structures were once again permitted, it may give land owners incentive to build and live smaller. If they can divide their land up, live in a smaller dwelling, and build other small dwellings to rent out, it gives them an added income and value to their property. It also has the potential to create a successful “mini community” that all persons involved can benefit from.

A contemporary example of this type of housing structure can be seen in Ryue Nishizawa's *Moriyama House*, where Mr. Moriyama, the owner of the property, lives on site with the renters of his units. Speaking of the social changes and privacy issues in Japan, Nishizawa “bemoans the recent loss in Japan of a more relaxed attitude towards privacy and boundaries. Gone are the days when care and commitment went into tending the street outside one's house; instead, all the effort of cleaning goes on within the boundary walls, while the streets are left strewn with rubbish.”<sup>118</sup> The same can be said of Honolulu where, with demographic and generational changes, homes have become more hermetically sealed and introvert—less about the outdoors and others. The plan of Moriyama is cleverly laid out with accommodation “surprisingly spacious.”<sup>119</sup> The configuration of Mr. Moriyama's house is:

spread over four separate units and includes a four-storey tower with a bedroom in the cellar, a sitting room on the ground floor, a library on the first floor and a sitting room-cum-gallery at the top. Surrounding the client's own garden are a small pavilion containing a bathroom and another housing a kitchen...this 'village requires the resolution to step out into the world and meet other people.’<sup>120</sup>

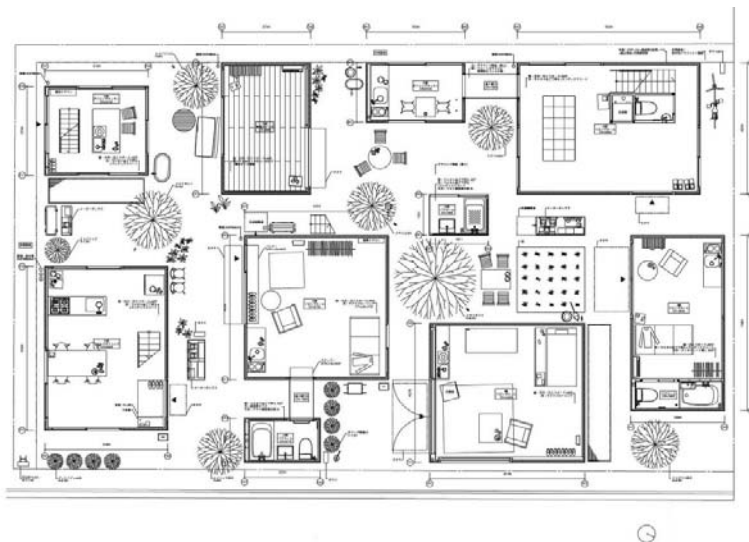


Fig. 23 Floor plan of the Moriyama House

<sup>118</sup> Sumner, 210

<sup>119</sup> Ibid.

<sup>120</sup> Ibid.

## Cooperatives and Communal Living

Housing cooperatives are useful in providing people with an affordable option to housing ownership. *Housing cooperatives* are defined as a “cooperative where member-residents jointly own their building.”<sup>121</sup> This means that the residents own shares of stock that the “cooperative apartment corporation allocates to their unit.”<sup>122</sup> This is one difference between a cooperative, or *co-op*, and a condominium ownership. It’s said, “particularly, in high-cost markets, cooperative housing is an effective means for households with little savings and limited income to achieve homeownership.”<sup>123</sup> The main objective for cooperatives is “to obtain for low- and moderate-income families decent housing, at an affordable price, with effective resident control”<sup>124</sup>.

There are countless advantages to the cooperative housing structure that gives many people the option of owning a home. Especially in desperate times, restructuring our housing needs and goals should be considered. Options that better fit our budget but don’t necessarily sacrifice quality of life or living standards should also be considered. Studies have shown that cooperatives in Canada and New York City have demonstrated to be the most affordable housing alternative when the quality of housing is assessed.<sup>125</sup> Low operating costs are also an added benefit to co-ops as they are 50% lower than public housing and 21% lower than rental properties.<sup>126</sup>

Another advantage of co-ops versus condominium is that they are “less expensive per square foot than condos, and their maintenance fees -- which cover building expenses like hot water, heating, air-conditioning, grounds maintenance, staff salaries, real estate taxes and insurance -- are tax-deductible.”<sup>127</sup> This is an important benefit as rising taxes and added government fees can be the culprit in the lack of housing affordability.

Gerald Sazama also brings up two good points about the lower income tier of the population, that “in a world that is increasingly market driven, cooperative housing provides contemporary housing advocates with an alternative that reinforces joint ownership of property...affordable housing

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<sup>121</sup> Sazama, 2000, 575.

<sup>122</sup> Differences Between Co-ops and Condos.

<sup>123</sup> Lewis, 3.

<sup>124</sup> Sazama, 2000, 574.

<sup>125</sup> Lewis, 2.

<sup>126</sup> Ibid, 2.

<sup>127</sup> McLinden.

cooperatives empower low- to moderate-income families, since under the cooperative structure they own and control their own housing.”<sup>128</sup> He goes on to say that co-ops are “contrary to the traditional welfare mentality prevalent in so much of subsidized rental housing because with co-ops, residents not only take responsibility for their actions, but they experience the direct consequences of these actions on the cost and quality of their housing.”<sup>129</sup> This forces people to take initiative and hold a responsibility, and in effect, become less dependent on government subsidies or financially aided support. With that, co-ops can play a greater role in our communities and effectively start to improve our social structures by creating healthier, more responsible and independent living environments—something that everyone can benefit from.

The first cooperative in the US was organized by Rochdale Cooperative Principles and was developed in Brooklyn in 1918 by the Finnish Home Building Association. There were twenty-five Finnish cooperatives by 1926 in a seven block radius of Sunset Park. These all survived the great depression due to the fact that most of them had no mortgages.<sup>130</sup>

Unions played a big part in the structuring and sponsorship of cooperatives. Without them, many would not have survived. Sazama explains that:

many unions sponsored affordable co-ops in the 1920s, the most well-known were sponsored in New York City by the Amalgamated Clothing Workers Union. This union had strong socialist influences, as well as experience with many self-help projects for working families, including credit unions and an early experiment in social security. Therefore, housing cooperatives were consistent with their other organizing efforts.<sup>131</sup>

Even more recent, unions played a part in cooperatives. After World War II:

...trade unions in New York City sponsored affordable cooperatives. In 1951, under the leadership of Abraham Kazan, these groups formed the United Housing Foundation (UHF). This formation

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<sup>128</sup> Sazama, 2000, 574.

<sup>129</sup> Ibid.

<sup>130</sup> Sazama, 1996-09, 1.

<sup>131</sup> Sazama, 2000, 578.

spurred enough activity that by 1965 the UHF and its predecessors had created 23 cooperative housing projects in New York City, ranging in size from 124 to 5,860 units.”<sup>132</sup>

Some co-ops had restrictions on the income of initial occupants but “there were no formal restrictions to sustain affordability.” But “because of their neighborhood location, unit sizes, and the effects of a union sponsored history, these co-ops remain as moderate income co-ops”<sup>133</sup> These unions played a big part in keeping co-ops affordable.

The affordability of a co-op can change through a period of time as housing market rates are never static. This happens when the co-op is a market-rate co-op, meaning the shares have the ability to be bought and sold at the market-rate, much like a typical single-family house. The 1990’s saw shifts in the national real estate market and many of the cooperative units were “appraised as having a market value of over \$200,000 each.”<sup>134</sup> With this came debates on whether to convert the co-op into a market-rate co-op or preserve the co-op’s housing affordability. It turns out that the cooperative was in an “urban renewal” zone which meant it must remain as an affordable co-op for 40 years.<sup>135</sup> The urban renewal zone saved the cooperative from becoming a high-income housing.

As I pointed out some of the advantages of cooperatives, now I want to touch on the disadvantages. In terms of the financing:

Most co-op owners cannot get a home equity loan or line of credit and in a co-op each individual is dependent on the solvency of the entire project. If the corporation were to go bankrupt, all shareholders would feel the pinch.<sup>136</sup>

This materialized in the 1930s, when most of the higher-income cooperatives went bankrupt due to excessive mortgaging, promoter profits, and high cost of apartments.<sup>137</sup>

In terms of maintenance fees:

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<sup>132</sup> Sazama, 2000, 581.

<sup>133</sup> Sazama, 1996-09, 2.

<sup>134</sup> Ibid., 3.

<sup>135</sup> Ibid.

<sup>136</sup> McLinden.

<sup>137</sup> Sazama, 1996-09, 2.

... paid usually on a monthly or quarterly basis, generally are significantly higher in a cooperative [than a condo] because the corporation is collecting mortgage and property tax payments from each shareholder in addition to the periodic assessment for things like lawn care, pool cleaning, security and insurance. The corporation also frequently includes all utilities.<sup>138</sup>

Although the operating cost of the building as a whole can be significantly less than a condo, the maintenance fees of individual shareholders can be higher. However, these fees go toward the general upkeep of the building, including any repairs that must be made, which would be decided on democratically.

In terms of the board of directors who run the co-op:

Co-ops, on the other hand have the right to approve or deny the sale of shares on the basis, for example, of the buyer's perceived inability to make the payments. They can also block the sale to celebrities; for example, who they feel may disturb the peace and quiet of other shareholders. Cooperatives, of course, are bound by federal fair housing laws and cannot discriminate against buyers due to race, religion, sex, nationality, etc., but they can -- and do -- choose people based on financial resources and criminal background. Condos cannot exercise that kind of control.

In terms of safety, it can be highly advantageous in knowing the background of neighbors, however it can be a highly invasive process which can pry into private financial information.

There are clear advantages and disadvantages to cooperative housing. It can become an alternative housing ownership type for Honolulu, encouraging communal living, affordability, and ownership. Although there may be cooperative or communal living structures in Hawaii, presently, they are not seen as a desirable alternative housing and ownership structure and are not popular. What is gaining momentum however, are the farming cooperatives in Hawaii. These cooperatives encourage people to live and eat healthier by buying local, stressing that imported goods can be expensive and far less fresh than locally cultivated products due to the remoteness of the Hawaiian Islands. According to Bondera, "Cooperatives are a fast-growing segment of the eat-local food movement across the United

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<sup>138</sup> McLinden.



states, largely because they are locally owned, democratically controlled and responsive to the community. Consumer food cooperatives like Kokua Market on King Street emphasize locally produced and processed foods.<sup>139</sup> These aspects of the cooperative farms can be transferred to housing, mainly democratic control and community response, which can bring life to neighborhoods such as Liliha, encouraging community action and spurring new relationships.

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<sup>139</sup> Bondera.

## 6 Compact Elements

## Doors, Windows, and Walls

Residential districts, in Hawaii, require that a dwelling have a 10 foot setback from the street or front yard.<sup>140</sup> Usually a 10 foot setback transforms into the driveway for cars into the garage. Most cars have a space to park under a sheltered/secured area. Over the years, the garage has morphed into a more functional space to accommodate for a family's needs. This becomes relevant to compact living because the garage space has the unique ability to open and close according to user's desire. This inherent function will support the comfort levels of a small/modest sized space where restrictions in square footage can be alleviated by opening and closing.

Often, you will see people using the garage as extra storage or shed space filled with boxes, shelves, bikes, extra refrigerators for food storage, or other miscellaneous goods. It becomes a haven for hoarding. However, in other cases it does possess many positive qualities for becoming a desirable space to dwell in. Below left, a garage space turned into a storage space. Below right, a garage space turned into workshop.



The garage possesses a quality that other spaces of the house do not: a retractable wall. The garage door usually takes up the entire face of the front façade [of the space] to accommodate for the one or two cars to enter. This allows the space to be easily ventilated, especially during the hottest times of the day, with breezes effortlessly passing through and adequate natural light. This is opposite of some rooms in the main house which can easily build up with hot air because of inadequate fenestration.

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<sup>140</sup> Honolulu.gov, Revised Ordinances of Honolulu, Chapter 21, 51.

The garage is desirable space because it can be the closest connecting space of a house to its surroundings. It has the least barriers, it is the most permeable, and it is usually located next to, or near a garden or front yard space. In essence, it could turn into a patio space or veranda, adequately shaded and ventilated.

The garage has also developed into an area of entertainment: A place for parties or special occasions, such as, to gather to watch sporting events on television. In these cases, there will be seating and tables set up, barbeque grilling, coolers for beverages set out, and televisions mounted on the wall to enjoy the game with friends or family.



Above is a garage converted into entertaining area.

What is interesting about these types of activities is that they could very well be accomplished *inside* the main spaces of the house, however, people choose to have them outdoors. It is possible that these outdoor spaces are more desirable because they tend to be more comfortable, for the reasons mentioned above. This type of behavior suggests that people want more open spaces in their dwellings, ones that are closer to nature, open, public, and permeable—with the ability for a space to be flexible where users can control the degree of privacy, ventilation, and porousness of a space.

The garage is also interactive with the street. It is the linkage between street and house, so it forms a semi-private zone that allows occupants to engage with outdoors and street while there still remains an invisible barrier of safety and protection—advising outsiders that this zone is not for them.



Fig. 24 Garage door, partially opened and seating set up in front

Some good examples of spaces that were intentionally designed with this idea in mind are the Big Window House by Tezuka Associates and the Glass Shutter House by Shigeru Ban. In the Big Window House, the entire second floor front façade is retractable, much like a garage door. It is able to open to ventilate and connect with the street in the dense urban environment. Because of its limited square footage of 1200 square feet, the ability of it to open was a crucial factor in its ability of appearing more spacious by broadening views and perspectives and connecting with the outdoors. As Sumner puts it, "light filters easily through to the ground floor, while the elevated glazing draws visitors upwards to where the view to the south is framed by the building itself."<sup>141</sup> This design element starts to examine a deeper quality of architecture, posing the questions: *What is a window? What is a wall? What is a door?* (Granted, with the building codes much different from the US, it would be nearly impossible to have a completely retractable 2<sup>nd</sup> floor wall without proper railings or safeguards.)

<sup>141</sup> Sumner, 186.





Fig. 25 The Big Window House by Tezuka Associates

The Glass Shutter House possesses similar qualities to the Big Window House by encouraging a closer relationship with the street and surrounding landscape. It toys with the idea of enclosure and exposure, having the ability to completely expose itself to the street at desired times of day and also, conversely, shutting out and privatizing space when necessary. The moveable nature, inherent in the shutters and curtains, allows the space to flex according to occupant's desires, comfort levels, privacy needs, or changes in the day.



Fig. 26 Glass Shutter House by Shigeru Ban

## Stairs

An aspect of the house that sometimes gets glossed over is the stair or vertical circulation. The stair is a critical design element when dealing with compact space because the stair can take up a large portion of the volume of a space. Depending on how it is designed—the placement, configuration, size, and shape all have a great impact on the quality of the space.

Seen a lot for its practicality and easy access is a staircase directly in the center or off to the side of the foyer, very close to the main entrance. This configuration leaves much of the front of the house useless for dwelling as stairs are intended for circulating. Depending on how large the house is, stairs can take up a large portion of the square footage. Landings can be very consuming of space, requiring a minimum of 36" wide and long on both the first and second floor, in residential districts.

This type of configuration has been used widely throughout history. It can be seen in the typical configuration of Georgian Houses of the 18<sup>th</sup> century to many of the more modern house designs of today.

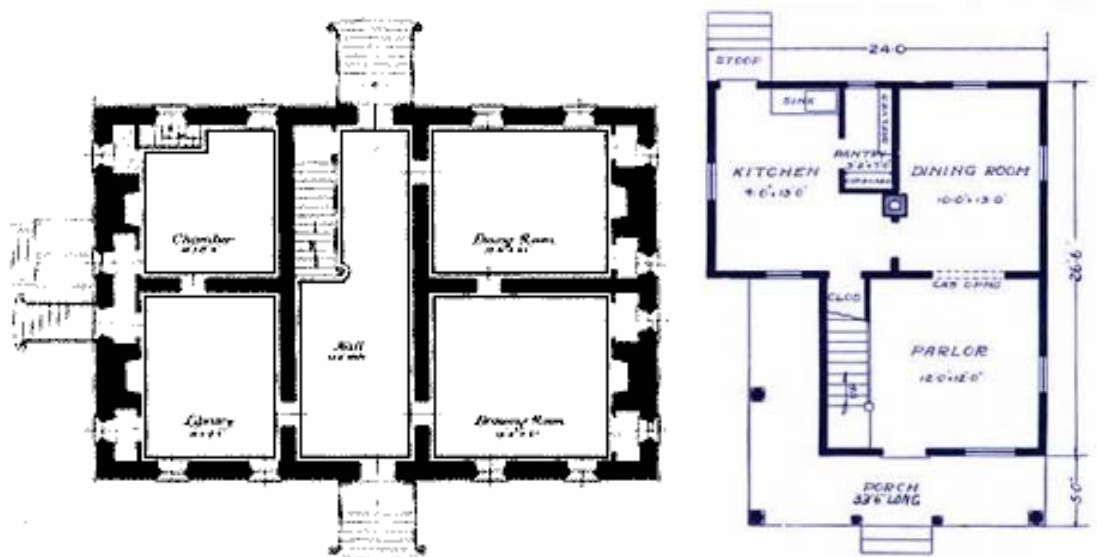


Fig. 27 Typical Georgian style house of the 1700s. Fig. 26 Typical Sears, Roebuck and Co. House of early 1900s.

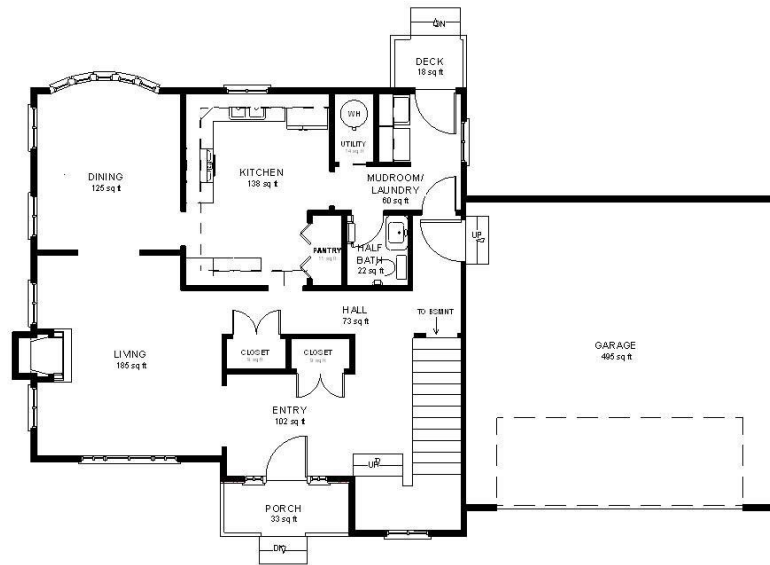


Fig. 28 Typical current tract home

The placement and configuration of the stair in the current tract home looks like an afterthought in design—with a couple of stairs jutting past the main entrance (not flush to the wall) and a landing right after. This only tells us that the designer failed to see other important design aspects of the stair besides simply being an instrument for getting from one floor to the next.

Why are stairs not thought of as a more essential part of the design, which can improve spatial quality of the entire home? Is there a way to make stairs a more integrated component of the house which can be utilized in a manner beyond circulation?

One technique of using the stair in a multi-functional way is seen in the Tread Machiya House by Atelier Bow-Wow. This house celebrates the stair by having it occupy a large portion of the living space. However, the design encourages people to not only use it as a means of getting from one level to the next, but also to sit and relax, or display and store objects on it. The house highlights the stair and this stair creates a new relationship between circulation and dwelling. What is also nice about this stair is that it allows us to perceive it as a more open and spacious environment by broadening the width, allowing for other activities and views.





Fig. 30 Tread Machiya by Atelier Bow-Wow

Vertical living in Tokyo is normal and it is not uncommon for some houses to have three or four stories in it. Many houses are situated on a plot of land that is no larger than a two car garage, so Tokyo architecture accounts for this short coming and regenerates space vertically. The House Tower, by Atelier Bow-Wow is an extreme example of vertical living. As pictured in the section to the right, it is literally a house made out of a staircase where the landings become the occupiable space and the stair is what transports you to each space. Each landing has a different function and the higher you go, the more private the spaces become. There are no partitions or doors within the space, it is a singular space. The division of space are the stairs and the horizontal



Fig. 31 Sectional model of House Tower expressing programmatic changes at each level change.

platforms. The aim [of this design] “was to ensure the maximum capacity that can be placed on the site, while discovering new behaviors within density and within a state of vertical expansion.”<sup>142</sup>

Another method of getting from one floor to the next is the ladder. This method minimizes the amount of space taken up by the vertical circulation allowing space to be used for other functions. The image below shows us how the simple mechanism of a retractable ladder can add to the aesthetic of the space while maximizing functionality: the wall that the ladder retracts into is also used as a storage wall.



Fig. 32 Retractable stair ladder leading to an attic storage space

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<sup>142</sup> Atelier Bow-Wow, 2007, 113.

## Bathrooms

Bathrooms practically design themselves as building codes suggest minimum requirements for how much space each is needed for each functional piece. Toilets and sinks require a minimum of 21 inches of clearance for someone to sit or stand, and maneuver between functions. Shower space requires a minimum of 900 square inches (30"x30") with an additional 24 inches of clearance space at the opening. All spaces and functions are separated resulting in a considerable amount of clearance space needed.

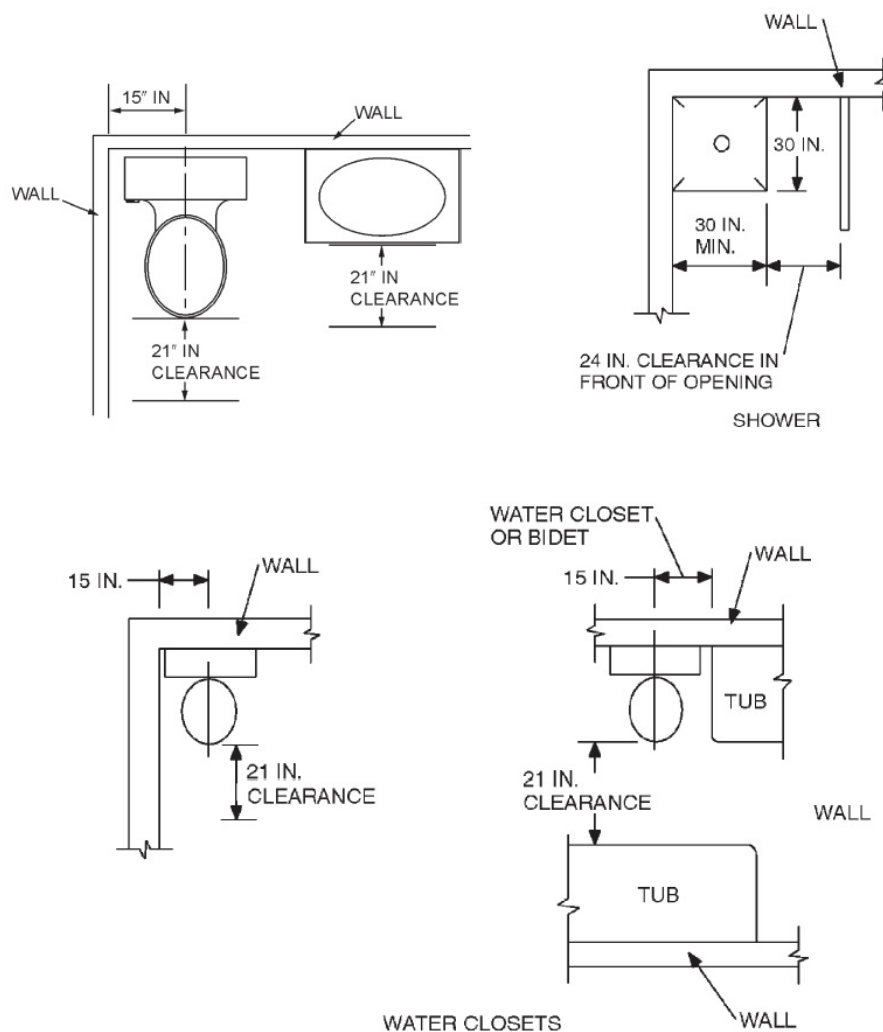


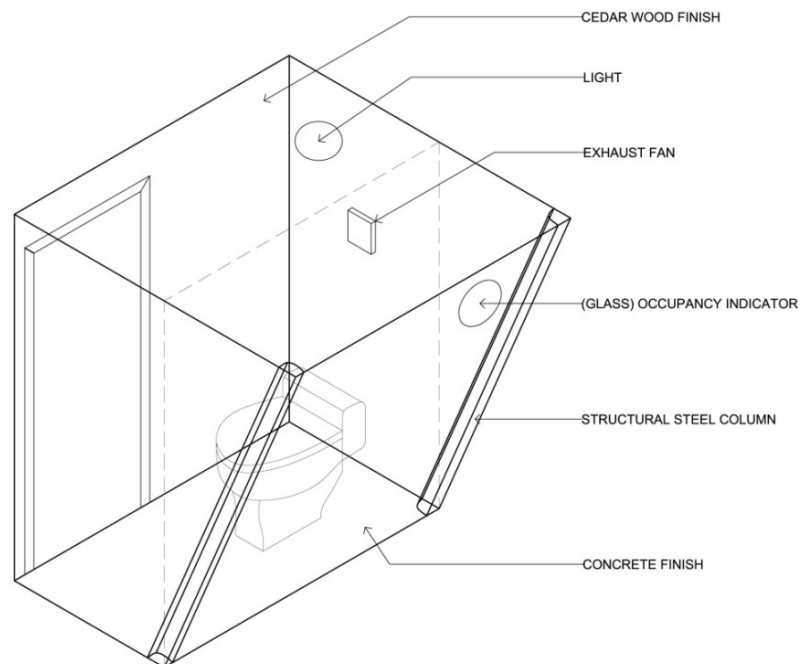
Fig. 33 Diagrams of residential toilet and shower codes found in the International Residential Code

Although spacious bathrooms are desirable, a small or compact dwelling has no space to waste. Any extra space, such as the separated clearance spaces in figure 31, could be offered to more enjoyable areas such as the kitchen, living space, or bedroom. Much like stairs, bathroom space can take up a good portion of a dwelling and minimizing the size by compounding functions is one way of reducing its impact on the square footage of a home.

In Asia, compounded bathroom space is common. As said before, in highly dense cities such as Tokyo and Seoul, space is so limited that efficiency is maximized. It is not unusual to see bathroom spaces compounded. For example, in the image below (left), a bathroom in Tokyo will utilize tank water as a method of washing hands when the flush is activated. The sink and toilet are a mixed-use of function which is not only efficient in space saving but also efficient in saving water and resources as the water you use to wash your hands will also be used with the next flush. (This doesn't always replace the sink feature in the bathroom, however I believe it could.) The image below (right) was taken in my bathroom in Seoul. The shower and sink are intended to use the exact same space for both showering and washing hands. The faucet incorporates a knob that toggles between either sink faucet or shower faucet. Although showering in here will drench the entire space, it isn't much of a concern as water evaporates quickly, and shower slippers can be used if needed.



In Atelier Bow-Wow's House and Atelier, the office bathroom is embedded into the slant of the house. The floor plan is simple: enough to fit one toilet and one person, similar to the size of a standard public restroom. However, the slant in the wall is utilized to make the room feel more spacious. It grows significantly wider, towards the ceiling, giving the occupant more space to move the upper body. This spacious feeling is important as there are no windows to the outside, simply a very small glass hole at the top of the slanted wall where a little light can penetrate through if the lights are on, indicating the bathroom is occupied. The slant is also important in reducing the feeling of claustrophobia. If there were no slant in the wall, the room would feel unacceptably cramped and restricting. This wall not only acts as a structural component of the house but also as a spatial enhancer.



As with most configurations and building planning, many spaces are dictated by the building codes. Could these efficient and effective ways of planning a bathroom in Asia be useful in America? Although it would take some getting used to, these compounded spaces can be advantageous in compact living.



## Storage

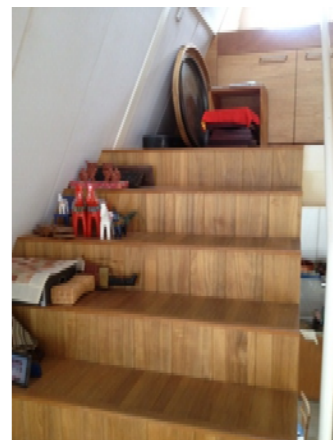
The most important component, when living in a small space, is storage. Without proper storage, things will pile up in the most undesirable places. Keeping a space clean and tidy only works when you have a designated place to put things. We often accumulate items throughout the years as many of us do not get rid of items as we bring new ones into the house. Storages are great for the types of things we do not need on a daily basis and they can be designed within primary elements throughout the house, as a secondary function.

Stairs are a great storage space. Because it is difficult to occupy the space below the stairway, it becomes a unique place to store things. Often, closets, drawers, and cabinetry can be found within the stairs, adding a secondary function. Below are staircases with storage spaces designed into it.

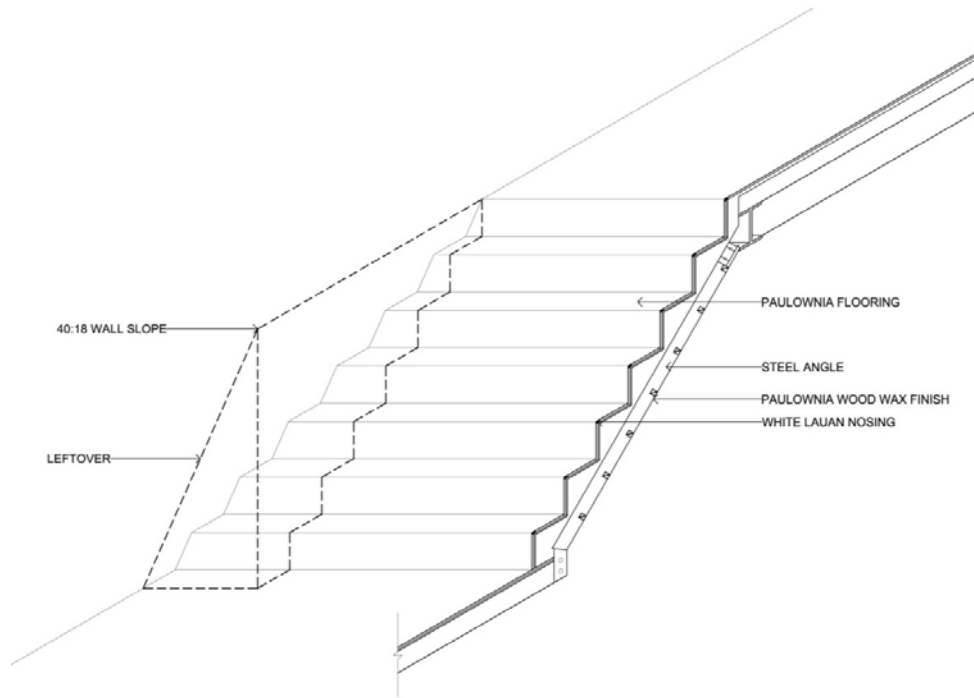


Fig. 34 Stairs functioning as storage

In House and Atelier (refer to previous page) the stair leading up to the private restroom allocates a leftover space. Because the wall parallel to the stair is slanted inward from the envelope, there is not enough headroom for you to walk directly next to the wall. There is a void space that emerges directly below the slanted wall, providing no function for you to walk on it. Not wanting this space to go to waste the occupants use this



space as a display and storage for items. It becomes an ideal space for this behavior.



Floors can also function as storage spaces. Access floors have been developed for office spaces to hide electrical wiring. Much like a dropped ceiling, a raised floor consists of a frame with panels sitting on top of it, producing a floor. This idea can be transposed to the living unit, allowing for storage spaces under the floor.



Fig. 35 Access flooring for office. Fig. 36 Storage below floor.

## 7 Typological Analysis

The city of Honolulu is known for array of different typologies. This section will focus on these particular typologies:

- Walk-up Apartment
- Plantation House
- Shophouse
- Court Development

Each of these typologies has considerable compact living qualities to help guide the design of the project. Floor plans and site plans are included to understand orientation, organization, and internal layouts, with images and background information about the specific typologies and/or buildings.



## WALK-UP APARTMENT

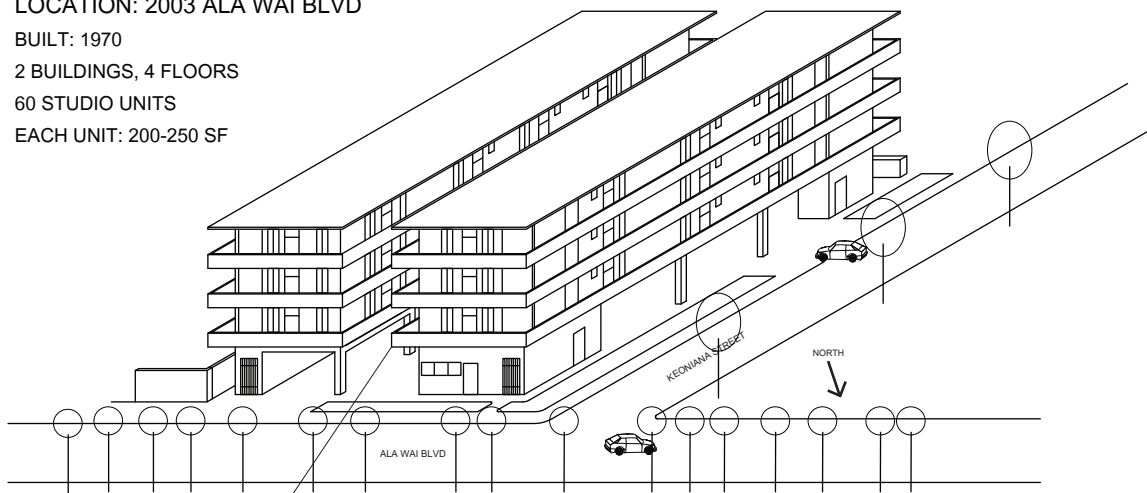
LOCATION: 2003 ALA WAI BLVD

BUILT: 1970

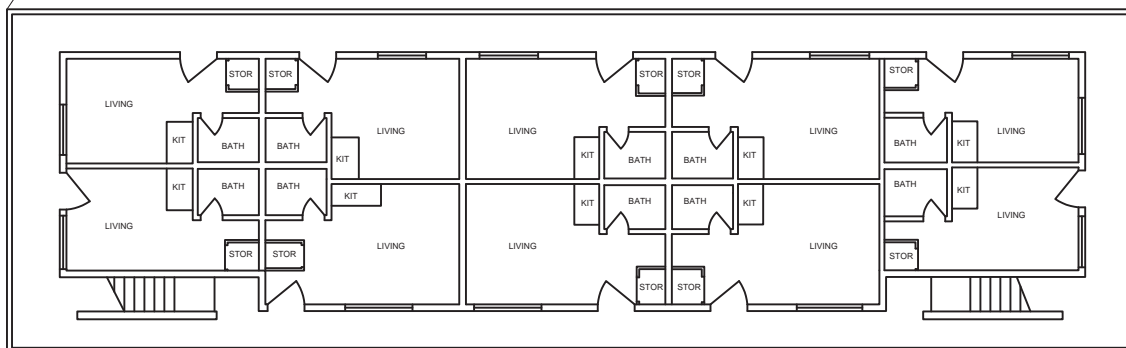
2 BUILDINGS, 4 FLOORS

60 STUDIO UNITS

EACH UNIT: 200-250 SF



The Ala Wai King is a typical example of a Honolulu walk-up apartment. It is located in Waikiki next to Ala Wai Boulevard. It is constructed of concrete masonry units with decorative concrete block guard-rails. Parking is located at street level with access from Keoniana Street for first building and access from Ala Wai for second building. Two floors of studio apartments are located above the parking. Apartment units range from 200-250 square feet. These units are similar in configuration, with the exception of the end units which are smaller to accommodate for the vertical circulation. Apartments are furnished and include a limited kitchen (hot plate, sink), and a bathroom. They also include a small storage unit. Access to the floors require a key for the gated doors.



Source: alawaiking.com

## WALK-UP APARTMENT

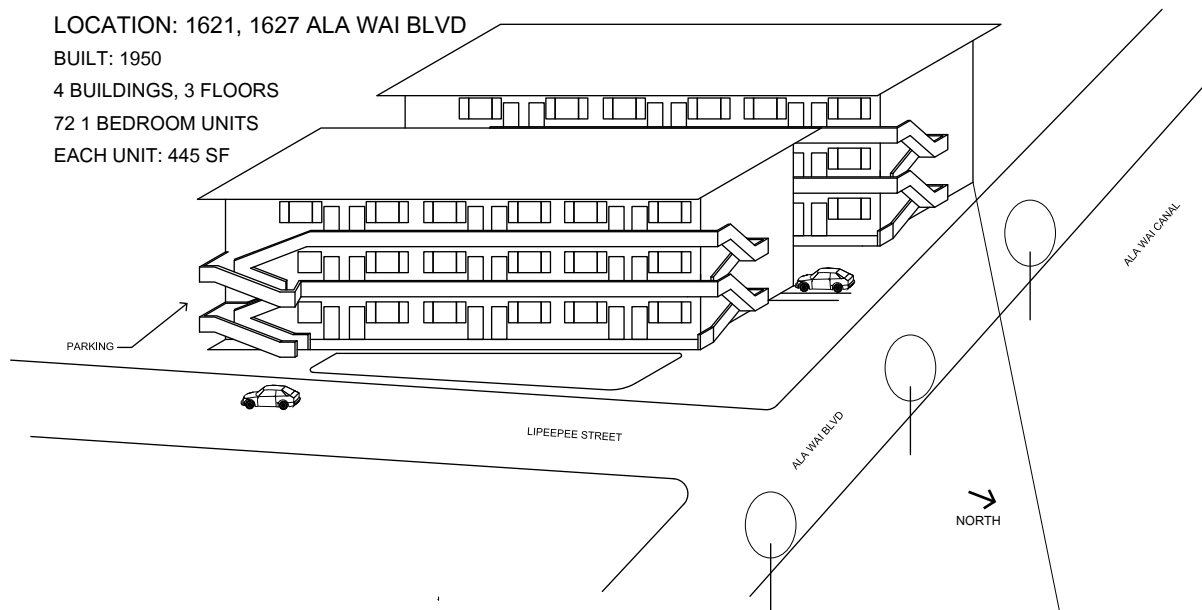
LOCATION: 1621, 1627 ALA WAI BLVD

BUILT: 1950

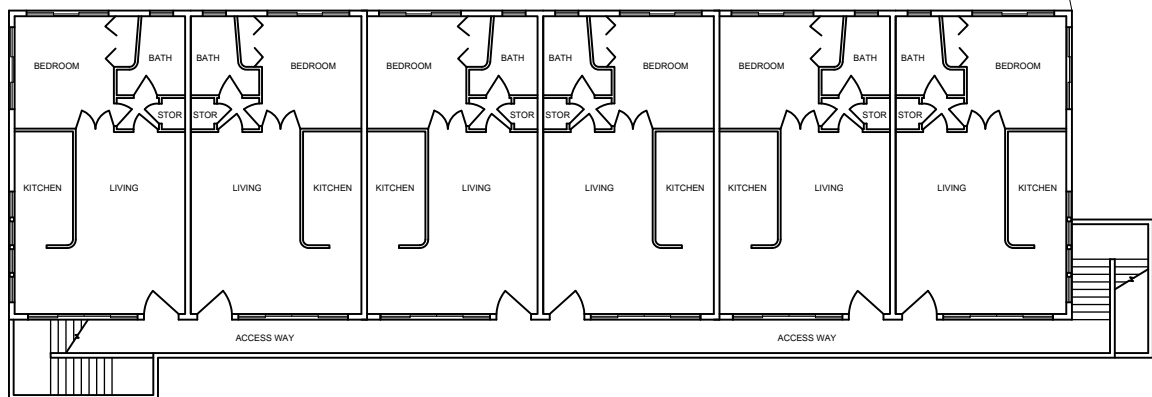
4 BUILDINGS, 3 FLOORS

72 1 BEDROOM UNITS

EACH UNIT: 445 SF



Hawaiiana Gardens is another typical example of a Honolulu walkup. It is located near the west end of Ala Wai Boulevard. It is constructed of concrete masonry units with decorative concrete block guardrails. There is on-site parking located in the center of the four buildings and a few stalls located on Ala Wai Boulevard side of the complex. All apartments units in all buildings are identical with one bedroom, a kitchen, and a bathroom with a storage space. There is private garden space for the complex located in the back of the buildings. Access to the two upper floors is located at the ends of the building. They are not secured or gated.

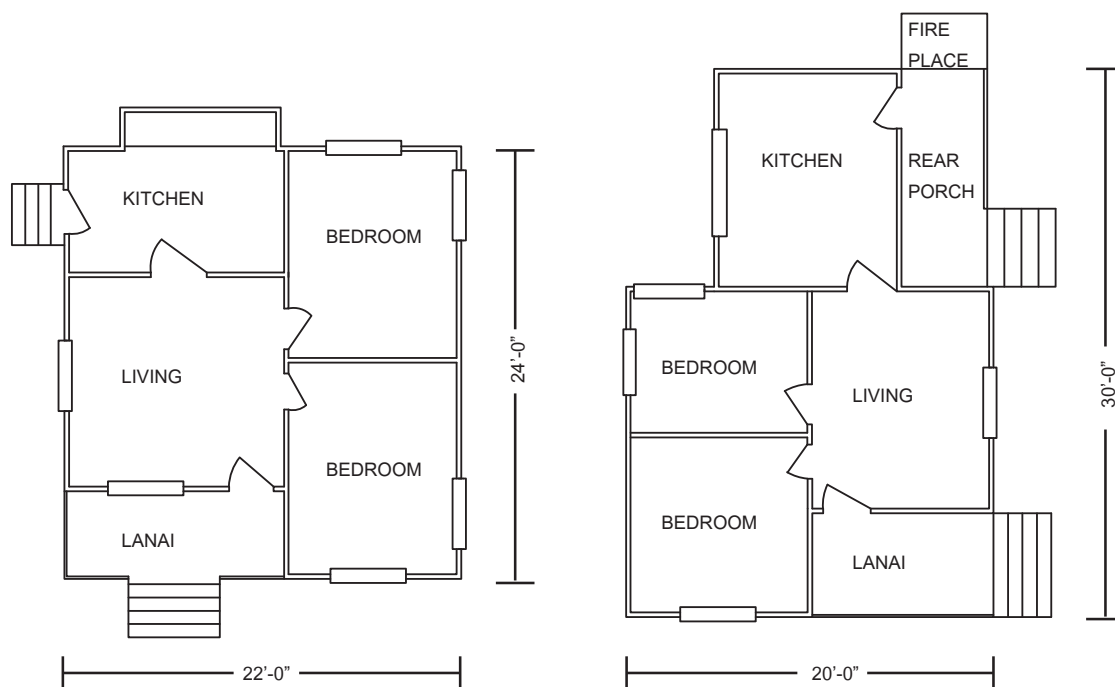


Source: buywaikiki.com



## PLANTATION HOUSE

The Plantation house is typically a single-wall wood constructed house with tongue and groove siding. The foundation consists of 3"x3" posts on stone footings. Many can be seen with a hip roof initially made of corrugated galvanized iron, however, today some have been replaced with asphalt shingles. These homes make up the historically preserved Ewa Village housing in the Ewa district of Honolulu County. Many of these homes can be seen throughout Hawaii with its simple construction and affordability. Units are small, roughly 500-600 square feet providing an outdoor lanai space and separated kitchen space. Bathrooms are not apparent in the housing plans below as there was a separate outhouse located nearby. Later plantation homes have been retrofitted or designed to provide indoor bathroom space. These homes were intended for single-family use.



TYPICAL FLOOR PLANS OF PLANTATION HOMES FROM HAWAII SUGAR PLANTERS' ASSOCIATION



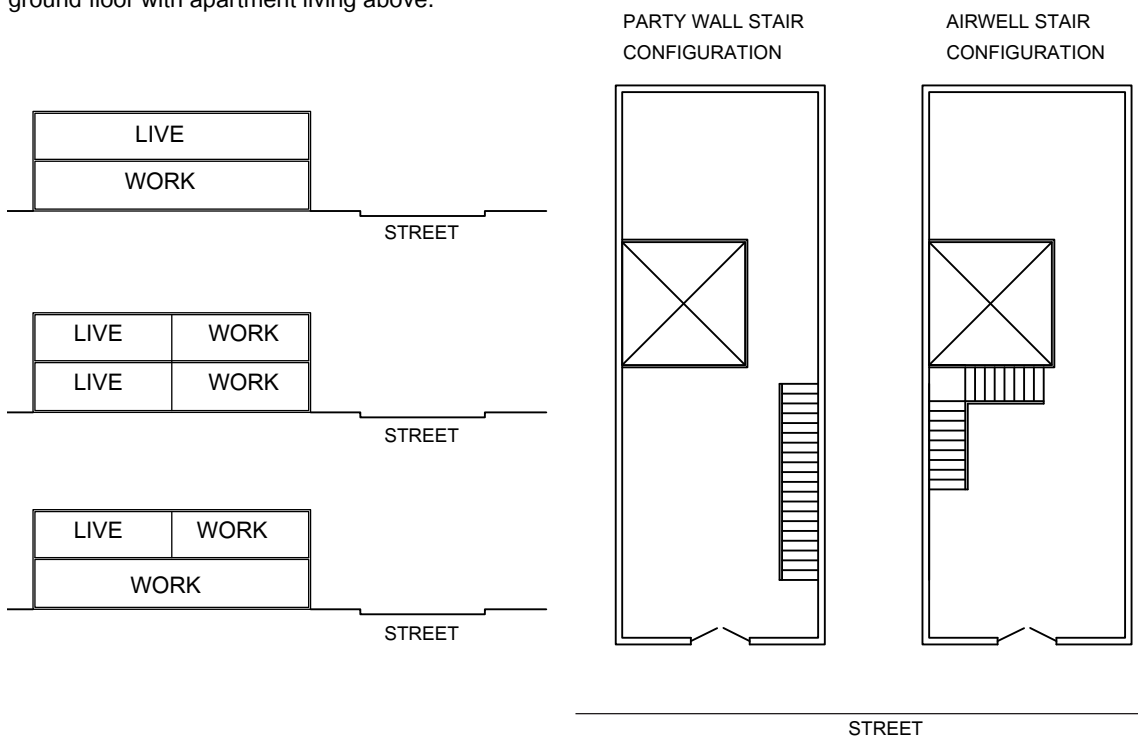
PLANTATION HOMES IN EWA VILLAGE

Source: Information and images courtesy Fung Associates, Inc.

## SHOPHOUSE

Shophouses are flexible in configuration but typically consists of a work space below and a living space above. Stairs are an important component of the shophouse linking the two spaces together. Interior stairs are sometimes seen in a party stair configuration, where the stairs run parallel to the party wall, and in an airwell configuration where the stairs run perpendicular to the party wall. This either maximizes (party wall stair) or minimizes (airwell stair) the interaction between the two spaces.

Numerous shophouses can be found within the Chinatown area of Honolulu, as pictured below. The Mendonca (bottom left) is one of the larger shophouse buildings which was built in 1901. It housed Chinese shopkeepers with businesses such as plumbing, paint facilities, and noodle factories. It went through several different phases of ownership and business. Today the building houses the Chinatown Artist Lofts, converting the second floor into 10 live/work studios. Other typical shophouses house several businesses on the ground floor with apartment living above.



Source

Diagrams and information: Derek Tsutomi, Shophouses for Honolulu: Integrating Live-Work Spaces in and Urban Environment

[http://hcadhawaii.org/index.php?option=com\\_content&view=article&id=15&Itemid=11](http://hcadhawaii.org/index.php?option=com_content&view=article&id=15&Itemid=11)

<http://chinatownartistslofts.com/>

## COURT DEVELOPMENT

LOCATION: 3513 HARDING AVENUE

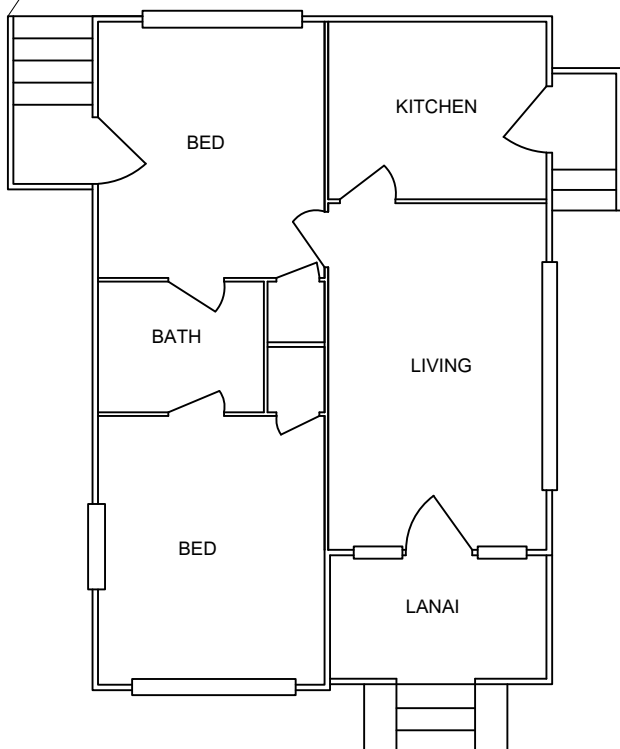
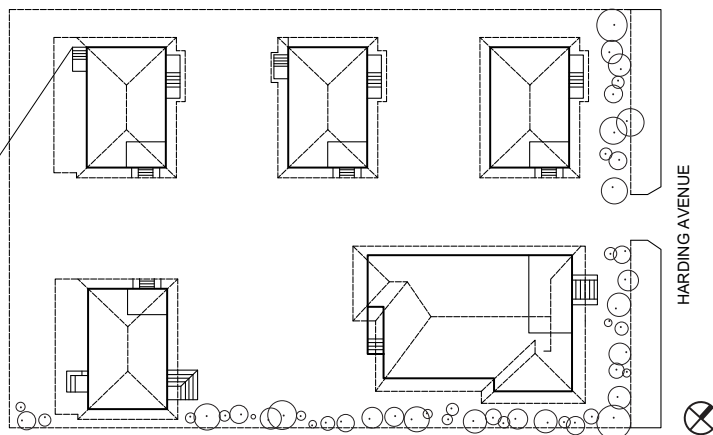
BUILT: 1922 (LARGER UNIT), 1929-30 (SMALLER UNITS)

1 MAIN UNIT, 4 IDENTICAL SMALLER UNITS

This court development consists of 5 single-family homes on a lot, 4 of which are of identical plan, and one larger unit built in an earlier stage.

These homes are part of a preservation and reuse project done by Epiphany Elementary School/Church, located at the adjacent lot (northwest).

Houses are reminiscent of plantation style single family homes, consisting of single-wall construction. The tongue & groove siding has been overlaid with composite sheathing and the original wood shingle has been replaced with asphalt sheathing. Private driveway accommodates foot and vehicular traffic with parking located next to units. Garden spaces surround the perimeter of the dwellings, with trees at street front and side for passive cooling and privacy.



STREET FRONT



PRIVACY/SHADE

Source: William Chapman, University of Hawaii  
Part of University of Hawaii's 1996 Pacific Preservation Field School



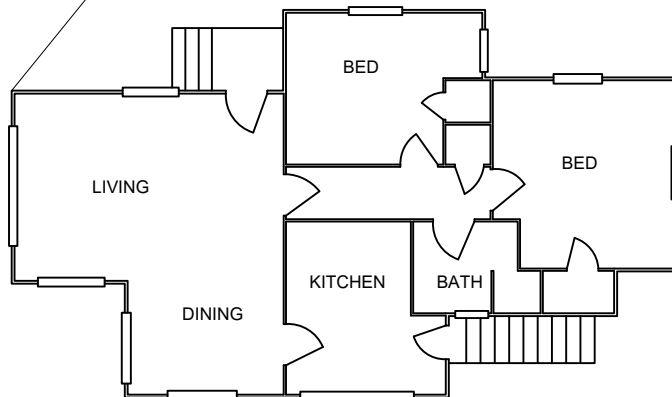
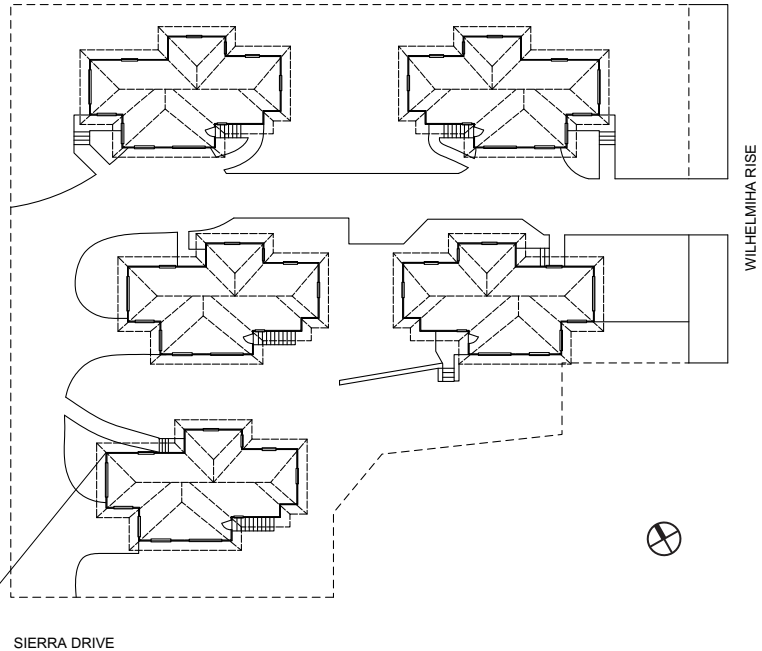
## COURT DEVELOPMENT

LOCATION: 1526 WILHELMINA RISE

BUILT: 1944, 1948

5 IDENTICAL UNITS

This court development consists of 5 identical single-family homes on a lot. The buildings are built of single-wall construction with tongue & groove siding. They are painted in the same pastel pink color with an asphalt shingle roof. Units also come equipped with a single covered parking space beneath the living space. Ample windows around the perimeter of living space allow for efficient ventilation and cooling. The lot is located on a steep incline up Wilhelmina Rise which accounts for a sloping site with varied stair configurations for entry into units. The site consists of two driveway entrance/exits, one at Wilhelmina Rise and the other on Sierra Drive. Garden space surrounds around units.



Source: William Chapman, University of Hawaii  
Part of University of Hawaii's 1996 Pacific Preservation Field School

The walk-up apartment is a distinguished affordable housing option in Hawaii and can be seen widely throughout Honolulu. It is often constructed of CMU for its simple, quick, and easy construction and affordability. They can also be seen constructed of wood, or a hybrid of CMU at the lower level and wood at the upper level(s). It's possible the wood upper level was initially a one story building and later placed on top of a constructed CMU base and ground floor. The quality and comfort of the interior units are questioned in Honolulu as CMU units have the ability to retain heat in its thermal mass throughout the day which can cause uncomfortable interior temperatures. Typically in these units, proper ventilation can be difficult with minimal punched out windows, but being on upper floors with more access to trade winds can help.



Fig. 37 (left) Wood Walk-up apartment found on Date Street with courtyard spaces

The plantation house is affordable and easy to construct. It is seen widely throughout Hawaii and has become one of the most easily distinguishable Hawaii vernacular, with its hip roof and outdoor lanai space. It is simple in plan and provides adequately for a single family. However, its affordability is mostly a result of its cheap materials and construction methods. The single-wall construction utilized can make the comfort levels of the interior unbearable in the hot summer months with its lack of insulative materials. Proper ventilation and adequate fenestration is very important. Also, the wood structure requires maintenance due to Hawaii's natural elements: ocean air, rain, humidity and termites or pests which can cause damage. Its engagement with the outdoors, in its manner of providing a private sheltered lanai or yard space, is important and conducive to healthy lifestyles. Besides the troublesome indoor temperature conditions, the house is relatively comfortable and is the essence of old Hawaii.



Fig. 38 Interior and lanai space of a plantation house built in 1939 in upcountry Maui showcasing the single-wall wood construction, covered outdoor space, and livability.

The shophouse is distinguished in its layout and configuration. It is usually seen with a shop or commercial space at street level and a living space above. Most of these shophouses have access to the living unit from the shop. This makes it difficult to renovate and revitalize into non-commercial user units. In 2005, the “Loft Law” passed making it possible for shophouses in Chinatown to renovate and revitalize the vacant live units of the buildings. The Mendonca Building was part of the Upper Floor Housing experiment. A study put out by the Community Revitalization Department of the National Trust for Historic Preservation found that there are challenges when reconfiguring these buildings including “public policy, lack of housing leadership, a lack of economic imperatives...”<sup>143</sup> Most important to this research however, is the difficulty in reaching upper floors without passing through businesses: “Many Chinatown buildings were built to serve business owners who lived upstairs from their stores. Many of the buildings are narrow, deep and lack independent access to the upper floors.”<sup>144</sup> It can be concluded that restructuring the housing structure (adding non-commercial user units) would not be advisable unless there is exterior access available.



Fig. 39 Chinatown shophouse live units, vacant and unused

<sup>143</sup> Chinatown loft study, 27.

<sup>144</sup> National Trust for Historic Preservation, 20.



The court development is basically made up of multiple plantation houses on a single lot. These can still be found but are not allowed to be newly constructed anymore. They are a good example of how communal living can contribute to the Honolulu in a positive way. They would allow people more options of housing and/or ownership. These can be seen throughout Liliha but are prevalent in the Kalihi, Palolo and Kaimuki areas of Honolulu. If zoning regulations were reconstructed to include this type of housing by making it less difficult to construct multiple detached units on a lot, it could alter our streetscapes, communities, and social structures in a healthy way by allowing us to densify without degrading the street—such as adding to the small scale atmosphere of Liliha, not drastically changing it.



Above are images of court developments in Kaimuki.

## 8 Maps

The following maps are provided, analyzing the Liliha neighborhood. These maps will help to guide the design of the project:

- Zoning
- Year Built
- Vacancies
- Type
- Trees
- Pathways
- Overhangs

Of these, information is given accordingly, with statements and images accompanying.



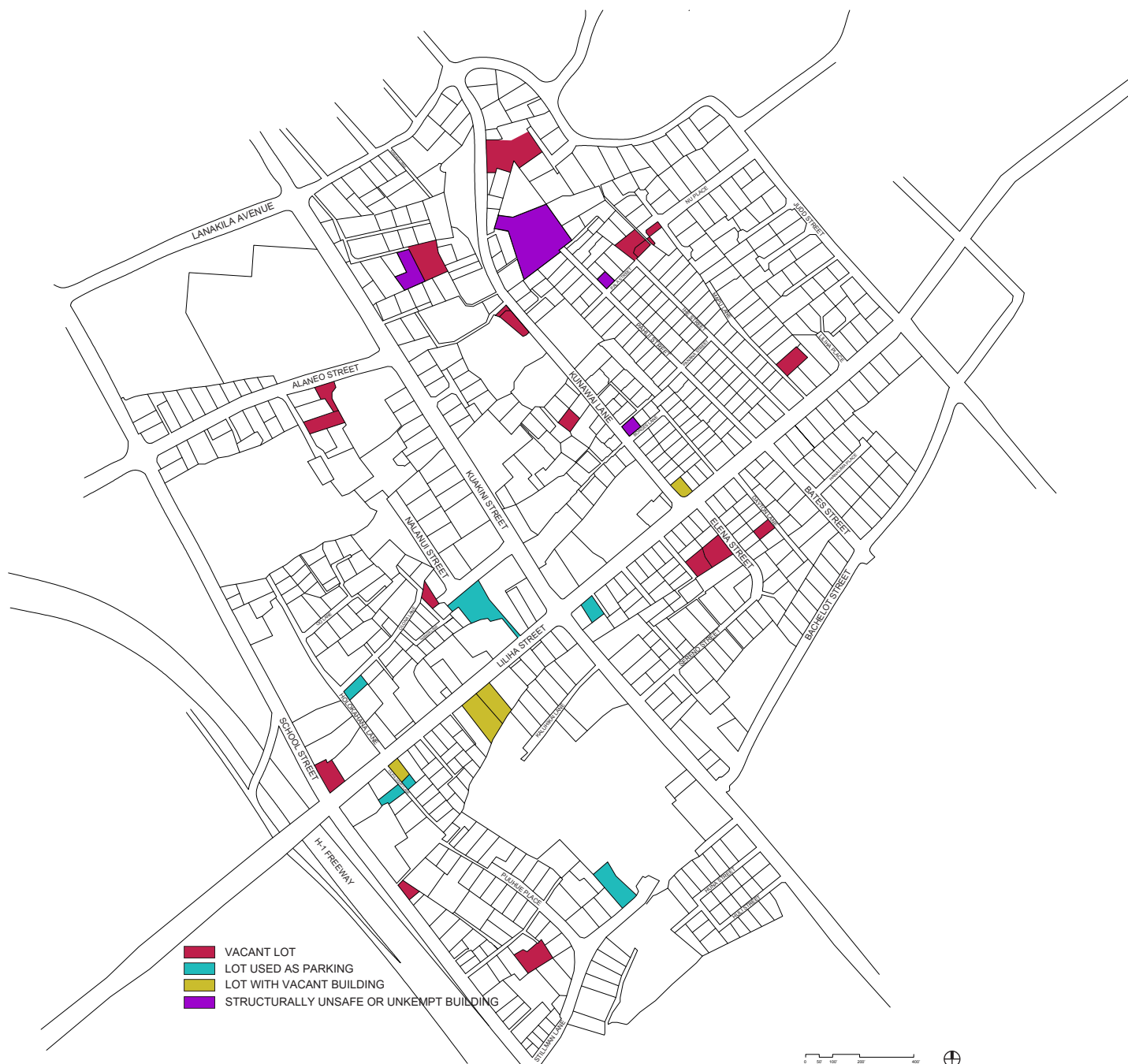
## Year Built

The range of building construction dates back to the 1900's to present. Many of the older buildings, constructed in the 1910s, can be found on Borges Lane. A considerable amount of buildings have been constructed in the 1950s to 1960s, found in clusters of residential areas near the upper portion of Liliha Street. Newer construction is less concentrated to specific areas, and can be found scattered throughout the neighborhood. Buildings which have not been highlighted did not have information available.



## Vacancies

There are a number of underutilized, vacant, or inefficiently used lots around the Liliha neighborhood which consists of parking lots used only during certain days of the week (or hours of the day), lots with consistently vacant buildings on them, lots with unsafe buildings (or buildings in disrepair), and completely vacant unused pieces of land. These spaces could be utilized more efficiently to support the existing character of the community. For example, parking lots could be utilized as temporary event grounds during vacant times of the day or week. Vacant lots and buildings can be utilized in a more effective manner to stitch the urban fabric of the neighborhood and increase density in a healthy way.







## WALK-UP APARTMENT

These apartments are typically two to three stories, constructed of CMU (Concrete Masonry Units). Parking is usually located under the building on the first floor. Units are located above. Usually they consist of an open corridor on the perimeter of the upper floors to circulate through the building. Some consist of decorative hollow tile guard rails. A limited garden space can sometimes be found in the back of the apartment complex, parallel to the building. Many units in Liliha can be found behind shophouses on Liliha Street and near Frog Lane where apartments are permissible.



1 421, 425, 427 N KUAKINI STREET  
2 BUILDINGS  
BUILT: 1967  
LOT: 11552 SF



2 414-416 N KUAKINI STREET  
1 BUILDING  
BUILT: 1956  
LOT: 7250 SF



3 1626 FROG LANE  
1 BUILDING  
BUILT: 1970  
LOT: 5745 SF



4 611, 617 N KUAKINI STREET  
2 BUILDINGS  
BUILT: 1970  
LOT: 15000 SF



5 623, 629 N KUAKINI  
2 BUILDINGS  
BUILT: 1968  
LOT: 15000 SF

6 832 KAMAKA LANE  
4 BUILDINGS  
BUILT: 1964  
LOT: 21820 SF

Source:

\*\* maps.google.com

www.honolulupropertytax.com/



## SHOP/HOUSE

Shophouses are composed of both residential and commercial spaces. They are typically multi-story buildings with the commercial portion at the lower floor(s) and the residential portion at the upper floor(s). Initially they were intended for shopkeepers to live where they work, but in many instances non-shopkeepers rent out the spaces above. In Liliha, they are mostly found on Liliha Street and Kuakini Street where zoning permits it, though older ones can be found further back into the residential zones.



- 1 1639, 1639 A LILIHA STREET  
2 FLOORS  
BUILT: 1926  
FIRST FLOOR: FLOWER SHOP, TELEVISION  
SERVICE, PARKING  
SECOND FLOOR: LIVING UNITS



- 2 1651, 1651 A, 1653, 1655 LILIHA ST  
3 FLOORS  
BUILT: 1964  
FIRST FLOOR: YAGURA RESTAURANT  
SECOND-THIRD FLOOR: LIVING UNITS



- 3 1733 LILIHA STREET  
2 FLOORS  
BUILT: 1993  
FIRST FLOOR: OFFICES, PARKING  
SECOND FLOOR: LIVING UNITS



- \*\* 4 1636, 1630, 1632 LILIHA STREET, 508 HOLOKAHANA  
LANE  
4 FLOORS  
BUILT: 1965  
FIRST FLOOR: CHINESE RESTAURANT, HAIR SALON  
UPPER FLOORS: LIVING UNITS



- \*\* 5 510 KUAKINI STREET  
2 FLOORS  
BUILT: 1959  
FIRST FLOOR: FINANCE FACTORS, PARKING, LIVING UNITS  
SECOND-THIRD FLOOR: FINANCE FACTORS, LIVING UNITS

Source:

\*\* maps.google.com

www.honolulupropertytax.com/



## ONE STORY HOUSE

These homes are typically single-wall construction, raised with stone footings as foundation. The perimeter of the crawl space is covered by a wood lattice. A stair leads to the entrance and lanai. Many of these homes could be considered plantation style homes. Occasionally, they will be fitted with extensions and additions (i.e. garage space). Each house has enough room for garden or yard space on the lot but how this space is used is dependent on the occupant. A considerable amount of these homes are found on Borges Lane, many dating to the 1920s.



1 1914 A LILIHA ST (Near Borges Lane)  
BUILT: 1931  
BUILDING: 652 SF, LOT: 2,593 SF  
2 BED, 1 BATH  
SINGLE FAMILY



2 2030 LILIHA ST  
BUILT: 1941  
BUILDING: 916 SF, LOT: 7,719 SF  
4 BED, 1 BATH  
SINGLE FAMILY



3 1829 LILIHA STREET  
BUILT: 1961  
BUILDING: 1,496 SF, LOT: 3,202 SF  
4 BED, 3 BATH  
SINGLE FAMILY



4 416 ELENA STREET  
BUILT: 1968  
BUILDING: 1,132 SF, LOT: 3,045 SF  
4 BED, 1.5 BATH  
SINGLE FAMILY



5 1906 LILIHA STREET  
BUILT: 1931  
BUILDING: 946 SF, LOT: 2,662 SF  
3 BED, 1.5 BATH  
SINGLE FAMILY



6 743 N JUDD STREET  
BUILT: 1924  
BUILDING: 1,180 SF, LOT: 5,563 SF  
4 BED, 1 BATH  
SINGLE FAMILY

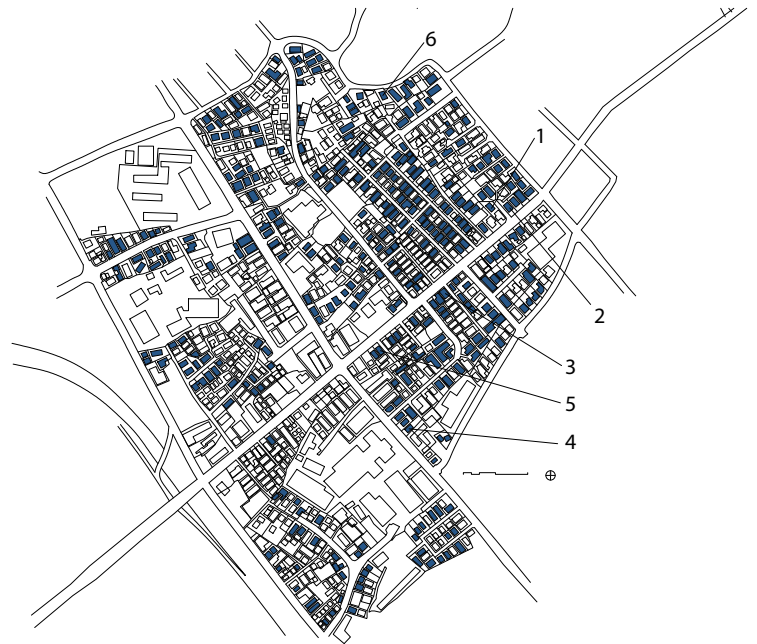
Source:

\*\* maps.google.com

www.honolulupropertytax.com/

## TWO STORY HOUSE

These homes are typically rectangular in shape with living space stacked over parking space and behind it. The first floor is usually constructed of CMU (concrete masonry units), and the second floor of single-wall construction. There is usually a stair at the side of the house leading to the upper living space. Occasionally these houses can house more than one family. Owners tend to live above and rent out the living space below as these spaces consist of a separate entrance. The homes on Judd Street slope downward and appear as single story homes from the street but are actually double story units.



1 511 LILIHA PLACE  
BUILT: 1966  
BUILDING: 1,230 SF, LOT: 5,001 SF  
4 BED, 2.5 BATH



2 2046 LILIHA STREET  
BUILT: 1966  
BUILDING: 1,264, LOT: 5,001 SF  
4 BED, 2.5 BATH



3 2017 LILIHA STREET  
BUILT: 1969  
BUILDING: 1,808 SF, LOT: 5,502 SF  
5 BED, 2 BATH



\*\*  
4 342 N KUAKINI STREET  
BUILT: 2008  
BUILDING: 1,296 SF, LOT: 6,016 SF  
4 BED, 3 BATH



\*\*  
5 1819 LILIHA STREET  
BUILT: 1972  
BUILDING: 880 SF, LOT: 3,546 SF  
5 BED, 2.5 BATH



\*\*  
6 721 N JUDD STREET  
BUILT: 1948  
BUILDING: 2,460 SF, LOT: 6,808 SF  
6 BED, 2 BATH

Source:

\*\* maps.google.com

www.honolulupropertytax.com/



## COURT DEVELOPMENT

These homes are arranged as multiple units (2 or more) on a lot. They typically are of similar construction and size utilizing the plantation style, single-wall construction. Most of these lots consist of private pathways connecting units, and garden or lawn space to tend to. These could be considered a micro-community within the larger community, encouraging communal-relationships between houses as no barriers (walls, fences, gates) are apparent between units. Share spaces are evident. These parcels also differ in land ownership structures. Some may be communally owned and others may be single-ownership and rented out units.



**1** 1657 LILIHA STREET  
BUILT: 1939  
UNITS: 6  
UNIT SIZE: 528 SF  
LOT: 11967 SF



**2** 530 HOLOKAHANA STREET  
BUILT: 1935  
UNITS: 7  
UNIT SIZE: 594-1040 SF  
LOT: 16800 SF



**3** 801 KUNAWAI LANE  
BUILT: 1936  
UNITS: 13  
UNIT SIZE: 474-1512 SF  
LOT: 31410 SF



**4** 719 PANUI STREET  
BUILT: 1946  
UNITS: 10  
UNIT SIZE: 460-1040 SF  
LOT: 28000



**5** 2002 LILIHA STREET  
BUILT: 1939  
UNITS: 4  
UNIT SIZE: 324-2248 SF  
LOT: 7400 SF

Source: \*\* maps.google.com  
www.honolulupropertytax.com/

## Trees

In Liliha, trees are a distinguishing feature for the existing buildings and streetscape. They give a building character, allow community members to collect under them, assist in creating space, and allow particular buildings an existence by distorting scale and camouflaging anomalous aspects of it. Trees also provide shade for passive cooling and privacy, creating a buffer zone between streets and buildings or buildings and neighboring buildings.





## TREES



1 Palm trees provide privacy and cooling feature for walkup apartments located on Puuhale Place.



2 Large trees at Kunawai Springs distort and mask the scale of 6 story condo adjacent, allowing its existence next to single story homes and buildings.



3 Large tree hides collapsing house from view at Kunawai Lane.



4 Large tree canopies shading the parking lot of office building. Good shading device for southern exposure.



5 Single tree acts as distinguishing feature at court development on Kunawai Lane. Shades branched pathways leading to units in the back.



6 Excess foliage around perimeter, especially front, of house provides privacy for occupants, creating a buffer between home and street and neighbors.



7 Tall trees at front become distinguishing feature of house. Also provides privacy at front entrance.



8 Line of trees provide shade for pedestrians on sidewalk and also cools building.



9 Trees on sidewalk provide shade for pedestrians and for elementary school activities.

## Pathways

Semi-private pathways can be found within the Liliha neighborhood. These pathways give community members quick access and shortcuts that navigate through the street blocks, similar to how alley ways function. These pathways are not typically used by outsiders (or persons not within the community) as it would be unfamiliar territory, proving difficult to navigate through, uncertain where they lead. Some of these pathways suggest entry is forbidden without any formal sign indicating legal action may result.





## PATHWAYS



1 Used as a single car driveway to access walkups in the area. Links Puuhale Place to School Street.



2 Used as a single car driveway to access court developments and single family homes. Has access to School Street.



3 Used as single car driveway. Unnoticeable if accessed from Puuhale Road.



\*\*

4 Shortcut through access way turned parking lot. Outlet on Liliha Street.



5 Branched pedestrian pathways within court development on Kunawai Lane.



6 Pedestrian shortcut cuts through from one place to single family homes to other semi-private pathways.



7 Pedestrian access from Kunawai Lane to court developments.



8 Driveway to single family homes from Kunawai Lane. Outlet on Kuakini Street.



9 Pedestrian pathway cuts through public park from Kunawai Lane to Pala Street

10\* Refer to Design Chapter  
Source: \*\* maps.google.com

## Overhangs

Overhangs are necessary in a place such as Liliha. With the strong southern exposure beaming during morning and afternoon hours, it is difficult to walk outside without breaking a sweat. Much like trees, overhangs provide pedestrians pockets of relief when walking from one destination to the next. Larger awnings and shaded areas can accommodate more of a gathering behavior as many are drawn to the dark shaded areas to rest and relax. Smaller awnings simply provide protection from the elements when walking down the sidewalk. There are various awning types found in Liliha used for a variety of different reasons, for instance, shading a side of a house or creating spatial extensions.





## OVERHANGS



1 Flexible/movable overhang in addition to fixed overhang, part of building structure.



2 Liliha Bakery overhang with setback and wide sidewalk.



3 Commercial overhangs on Liliha Street.



4 Residential building facade with vertical and horizontal shading.



5 High traffic shave ice store with added movable awning for southern exposure.



6 Residential awning added to existing structure.



7 Extended shading device added to existing structure creating small semi-private seating area for restaurant.



8 Typical walkup roof/walkway shading.



9 Residential awning added to existing structure.

## 9 Design

## Site Selection

Liliha neighborhood was chosen as the site of this project for several reasons. It is on the edge of northwest Honolulu making it a central area to live in. In driving distance, it is just minutes from downtown Honolulu, 10 minutes to Waikiki or Honolulu Airport, 12 minutes to the University of Hawaii at Manoa, and 18 minutes to the eastern edge of Kailua and Kaneohe (accessed through Like Like or Pali Highway). It has components of both city and suburban living: close enough to the city to have little or no commute to many conveniences and having some comforts of privacy and quiet of the suburbs. Liliha has several different types of living including single-family homes, multi-family homes, communal, or apartments. Also, it incorporates a strip of small businesses (refer to page 101) along the main access which give the neighborhood some variety in program.

The divisiveness of the H-1 freeway stunted the development of the neighborhood. However, the silver lining to this situation was its ability to preserve a feeling of old Honolulu in scale, spirit, and also timeworn buildings. With the many unspectacular buildings within the Liliha neighborhood (refer to page 19)—vacant, unused, or inefficiently used spaces—it is not the buildings, per se, that must continue to be preserved but the scale and atmosphere of the Liliha neighborhood that should be respected and reconsidered. The neighborhood feeling and quality is apparent in this area, with the generational demographics, one to two story buildings, narrow pathways used by community members, old “mom and pop” shops with regular customers from around the neighborhood, and community festivities. This atmosphere should be emphasized, preserved, and celebrated as it is essentially what gives Liliha its identity.

More attention is needed regarding the quality of these elements of Liliha, and in reconsidering the arrangement and organization. Liliha was built out of specific circumstances and has characteristics all its own. The zoning regulations (refer to page 101) of Liliha are strictly single zoned now, however it seems apparent by the slight scattering of shophouses that this was not always the case. If this zoning can once again be altered to include multi-use zoning, the neighborhood can be shuffled, creating new patterns and relationships more conducive to healthy, walkable and central living—making Liliha less of a transitional zone and more of a destination. Preserving the atmosphere while refreshing it would be most valuable.

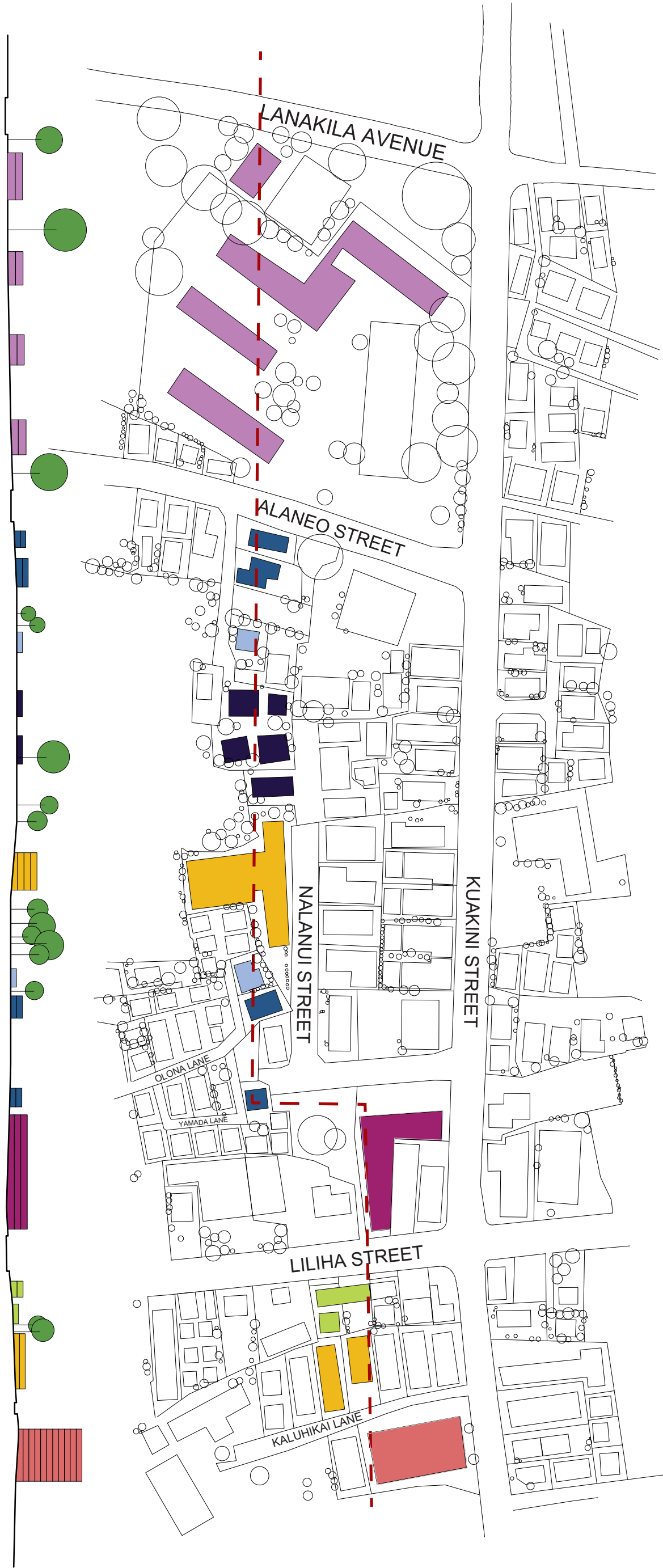
Shophouses, walk-up apartments, and plantation homes that were discussed are efficient in land use, affordable, easily constructed, and promote compact living. They can be found throughout Liliha. However, the quality of these typologies can be improved by reconfiguring, reorganizing, and reconstructing the fundamental principles behind them. By exploring techniques explained in this project, such as the compounding of spaces, allowing flexibility, zoning changes, and community development, this project will preserve those important elements which give Liliha its unique identity.

The scale of different issues in Liliha range from: urban development and zoning to smaller details of living space, comfort and quality. Narrow sidewalks, sparse shade during hot summer months, and cramped or tight living quarters are a few concerns that can be improved to enhance the quality of life in Liliha.

## Site Section

A section of Liliha neighborhood was taken through the Type map (refer to page 104) containing at least one of each type of building and program: a shophouse, walk-up apartment, one story house, two story house, court development, business, public service building, medical building, and multi-story condo. The section was found below Kuakini Street which contains the most variety in zoning and also consisting of the B-2 commercial district. This section will be evaluated, allowing the formation of new design decisions based on density, compactness, conveniences, and flexibility to allow for a better quality of life.

Site Section

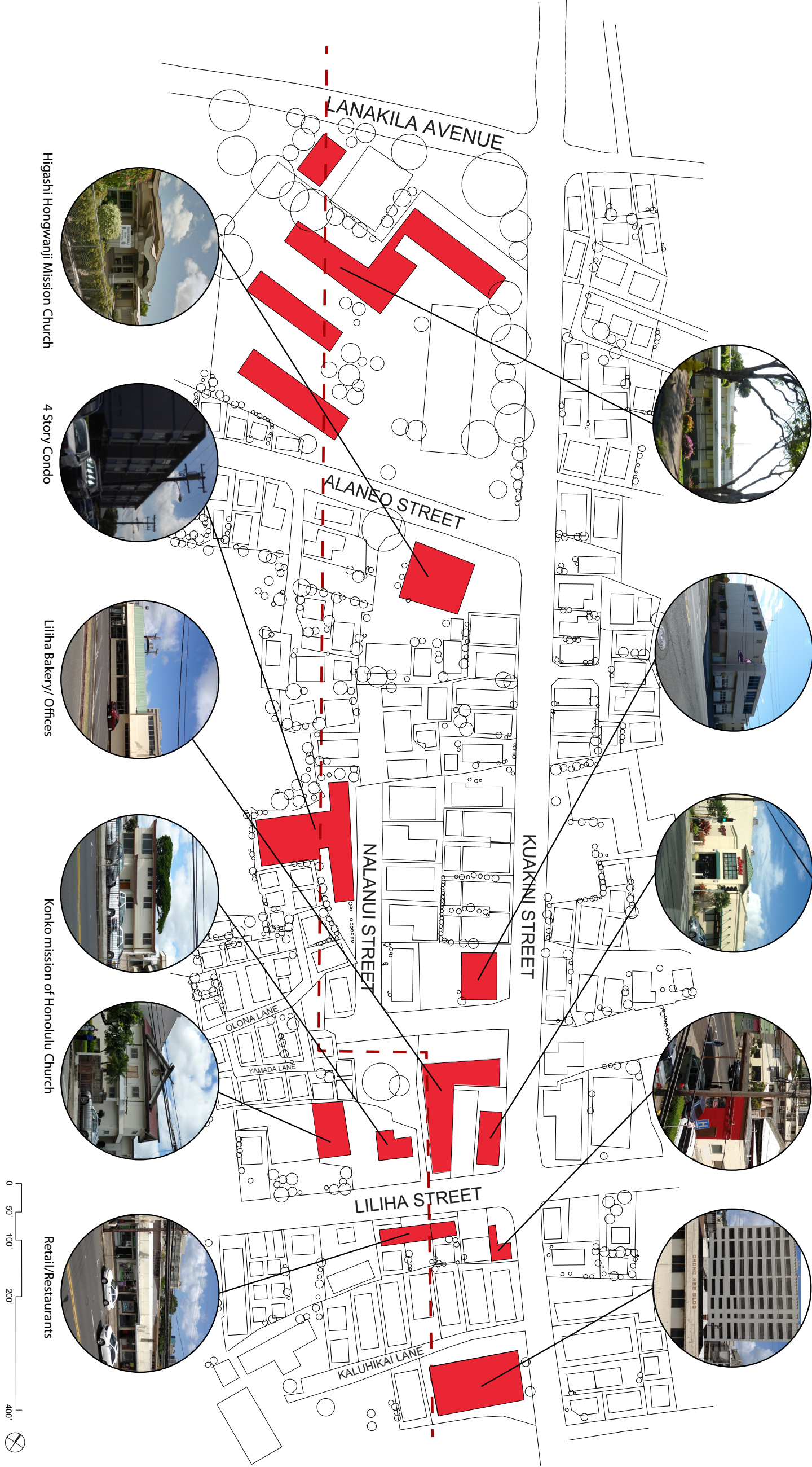


- WALK-UP APARTMENT
- SHOPHOUSE
- ONE STORY HOUSE
- TWO STORY HOUSE
- COURT DEVELOPMENT
- BUSINESS
- EDUCATIONAL, RELIGIOUS, PUBLIC SERVICE
- MEDICAL, NURSING HOME
- MULTI STORY CONDO





Existing Programs



## Site Section Proposal

Within the section, a variety of programs and activities is intended to bring more life to the Liliha neighborhood. Pocket parks are scattered throughout, utilizing vacant lots (refer to page 103) to be rezoned as a P-2 general preservation area. This can offer green spaces to the community, adding more diversity to the section. These parks will be connected by various pathways throughout the section. These pathways vary in the degree of privacy, similar to the ones already existing and used by community members or the public (refer to page 112). They are intended to develop and grow organically over time.

The court developments (refer to page 109) found within the section will be repaired, restored, and preserved. Value is added to the units and also to the streetscape. Once the restoration is complete, they could be eligible to be put on the historic register, granting occupants a government subsidy to keep the house in acceptable condition. This could become an excellent model for a large portion of houses within the Liliha neighborhood.

The large condominium found within the section can be reinvented to include retail and business and become a hybrid of shophouse-apartment complex. By adding retail spaces within, it changes the housing structure of the building and the zoning of the lot, increasing the density and programs within the site.

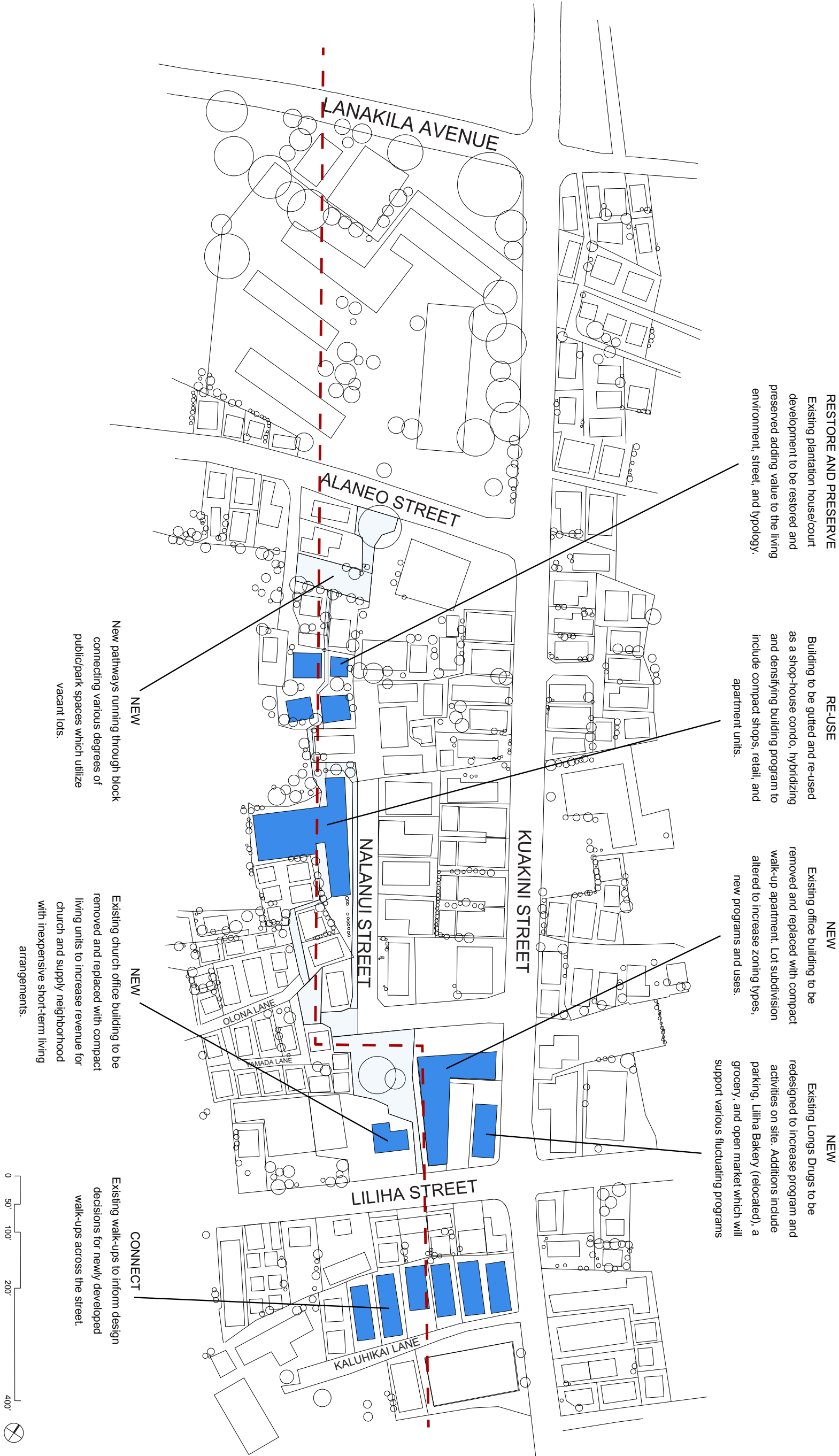
The three buildings at the corner of Liliha and Kuakini will be demolished. The first building is a Longs Drugs pharmacy which was built in 2009. Although it is only a few years old, the building does not fit the context of the neighborhood. It is a cookie cutter building that could be placed anywhere, lacking the sensitivity to the site and making no improvements to the quality of the street. The second building that will be demolished is the three story office building which most importantly includes Liliha Bakery. Although the programs of this building are valuable, the building itself is not. The building can be demolished and replaced and the programs relocated. The last building to be demolished is the secondary structure to the Japanese church which houses offices.

The site of these three buildings will be replaced by two walk-up buildings. Longs Drugs and Liliha Bakery will be relocated into a multi-use building which also includes an open market space, a grocery store, office spaces, and public parking. The site will also include a park and recreation center.

The walk-up typology was chosen as the concentration of this project. It is one of the more affordable typologies in Honolulu and can be found widely throughout the city. It already represents a compact lifestyle, however, there is much room for improvement in the quality of the space and living conditions. You can find several walk-ups across Liliha Street, behind retail shops and throughout the neighborhood. These walk-ups will be untouched but will serve as a comparison to the new walk-ups to be designed.



Section Proposal



## Site Plan

### Walk-Up

Affordable, efficient and compact, this walk-up type is a perfect candidate to be reconfigured to support a compact lifestyle. With several two-story walk ups in the neighborhood, this proposal includes two walk-up types on the site: A three story walk-up with commercial space at Liliha Street and a stepped interior walk-up which functions more like a townhouse. The variations within these two walk-ups will increase density; and they will offer new types of living within the area that are compact, flexible, and convenient. They will offer private exterior spaces not found in any of the walk-ups in Liliha, garden spaces, and public or communal spaces around the site. The three story walk-up, Walk-up 1, is split into two groups of 33 units with a fifteen foot shift in the center of the building for a breezeway, gathering, and pathway towards the open market. The internalized stair walk-up, Walk-up 2, consists of 18 units divided by a shared, semi-private garden with individual decks to plant and relax on.

These walk-up models are intended for one to two persons or in some cases, a small family of three. Although they are not for everyone or every type of family, it will give the single person or small family type a new option for living. Throughout Liliha neighborhood and Honolulu there is an abundance of options for larger families or living situations which include the plantation houses, court developments, single-family houses, or multi-family houses. There is less options geared toward the single person or small family which these two models could provide for.

### Mixed-use Building

The site plan consists of a lot adjustment at the corner of Kuakini Street and Liliha Street. Currently, Longs Drugs sits on two lots where one lot serves as parking for the store. This produces an underutilized, inefficient use of space. By combining these two lots and a portion of the southwest lot, a new type of public building can utilize this space to increase the activities in the neighborhood. This building will still function as a Longs Drugs, however it will also function as a parking lot, a renovated Liliha Bakery, a grocery store, and an open market space to facilitate temporary programs such as farmers markets, art shows, Liliha Festival, craft fairs, movie nights and other community events. By

compacting programs, increasing density and incorporating flexibility, a new type is generated for the Liliha neighborhood where new behaviors can thrive, allowing a larger threshold of useful public space.

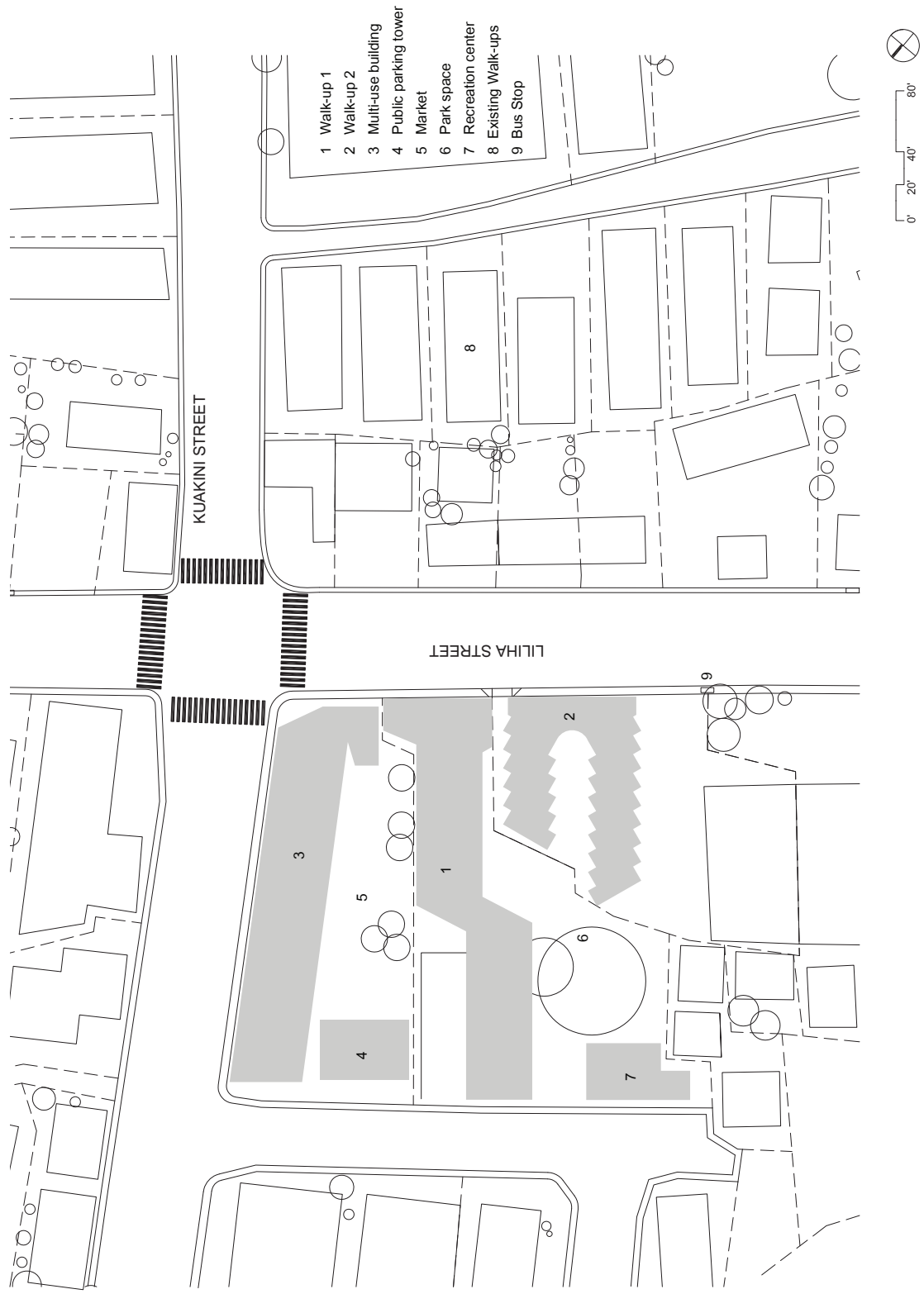
#### Public Parking and Transportation

Public parking will be incorporated in mixed-use building. Parking is an issue in the Liliha neighborhood, with no public parking lots and limited street parking. If programs and density on the site are increased, more public parking is needed to support the influx of newcomers. The parking system to be used will be the parking machines which stack cars in towers (refer to page 57), maximizing spatial efficiency. This system will use a hydraulic car lift to move cars up and down throughout the system, and will be operated by a worker to store and retrieve cars. There will also be standard parking stalls for visitors that will not be staying very long or when there is a low occupant rate. For those who commute by public transportation, bus stops are in close quarters.

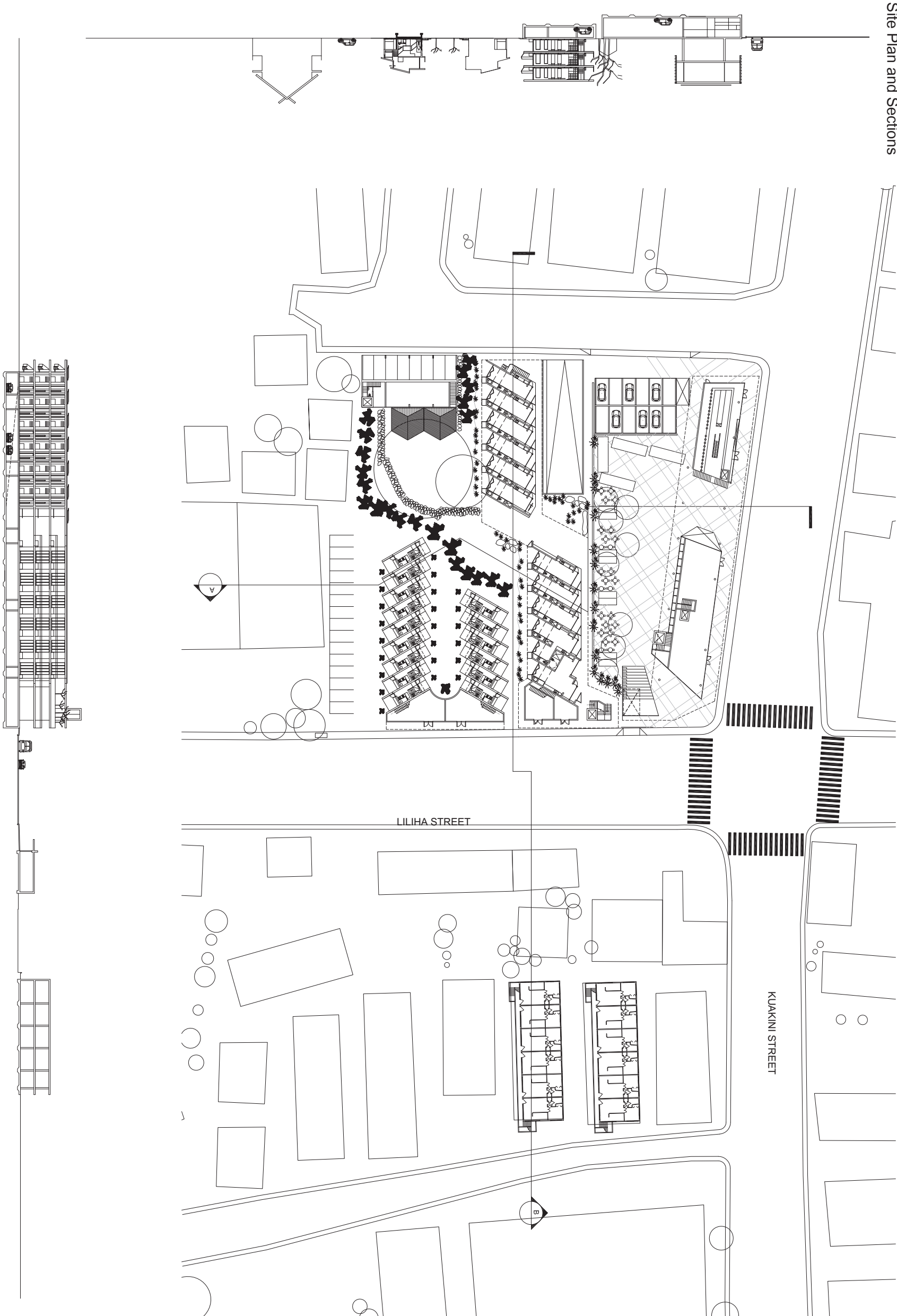
#### Recreation Center and Park Space

The recreation center is available for occupants of the walk-ups to use pool space for parties and gatherings. Additional parking is available for visiting guests. Because units minimize private living space, public spaces are maximized with an assortment of different programs which have different degrees of privacy. This includes the very public market and park spaces, semi-private garden spaces, and private pool and recreation spaces.

# Site Plan



Site Plan and Sections



## Walk-up 1

This walk-up was designed using a comparison of the typical walk-up. Aspects of the typical walk-up that were kept are the compactness and efficiency of space, the exterior corridor to access units, corridor also functioning as a roof plane, and the external stairways. Aspects of the typical walk-up that were changed are the orientation of structural walls and grid (now at a 30 degree angle), room divisions (now a singular space), connection of two walk-ups (increasing density and adding a central open gathering space) and moving parking to the basement (instead of at ground level). Other additions to the walk-up are garden and outdoor spaces, an elevator accessing five different elevations, exterior porch spaces, retail spaces at the street front (adding privacy to units), movable door/wall/windows, shading devices, and an open unit plan which stores all functions within structural walls.

By changing the orientation of the walk-up, the open plan of the unit is allowed to catch breezes and shade, and also orients the view toward the park and recreation center. The walk-up is shifted at the center, splitting units into groups of five and six at each level, creating a central gathering space at the two upper levels and a connection from the market to the park space at the first floor.

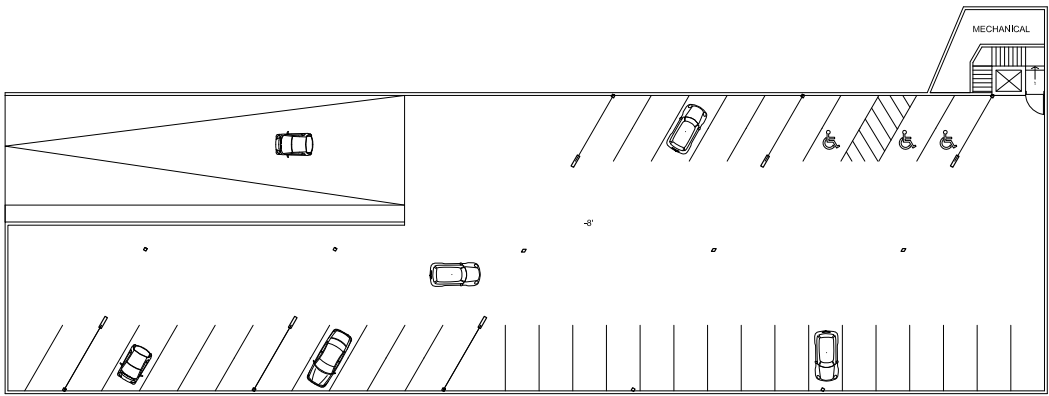
Trees and landscaping are added between the walk-up units and market space, creating a buffer zone. The new orientation also adds buffer zones between the units and the corridor with a new type of entrance or porch space (requiring one to step up to enter a unit) and planters demarcating units. The private outdoor space at the back of the unit is also a by-product of the interior configuration, with 24" planters separating units.

The retail space at the front is split into two businesses with internal stairs leading up to a second floor. Both exterior stairs and the elevator in the building are for residents only, adding security and privacy to the upper floors. The roof consists of photovoltaic panels and sedums for energy production and insulation, and a garden patch for residents to produce their own food.

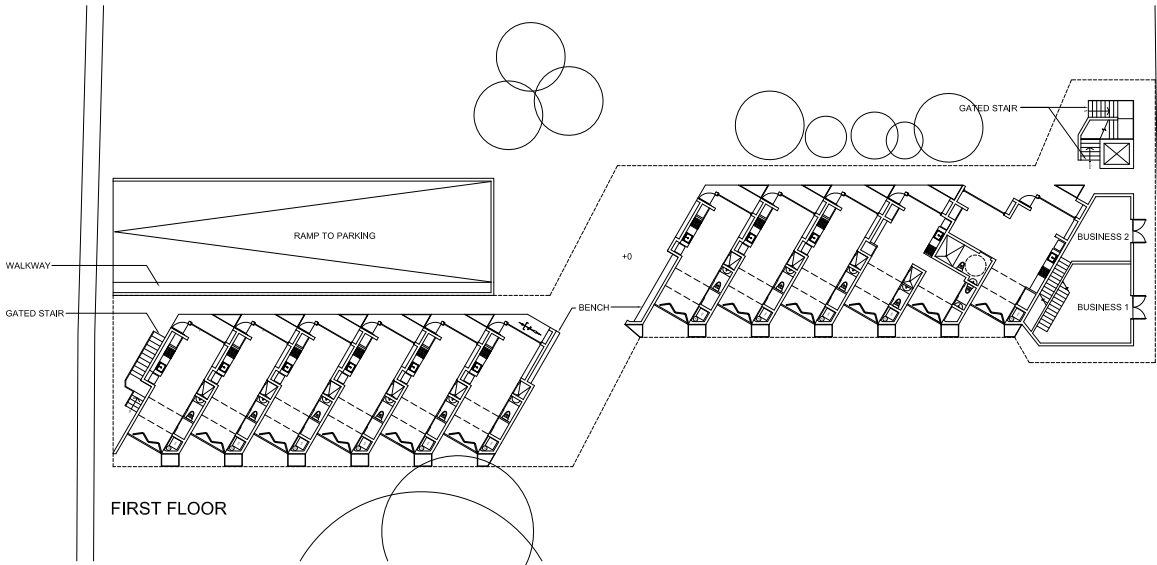
The structure consists of concrete slabs and concrete load bearing walls with wood infill. Pre-fabricated metal railings are installed at the upper floors, with a metal mesh screen attached. The garden which faces Liliha Street at the third floor uses planters for protection and privacy along the perimeter with a built in bench/seating area. Two wooden trellises at the third floor provide some shade while keeping the spaces bright and airy.

This walk-up has the potential of becoming a co-op (refer to page 71), giving residents the opportunity of living communally. There are several areas within the building that encourage communal living, including the roof top planting garden, the garden space on the third floor, and the gathering spaces at the center of the building. If all occupants equally own a share in the building, a higher regard for maintenance will be achieved, giving residents a better quality of life and forming a healthy building for Liliha neighborhood.

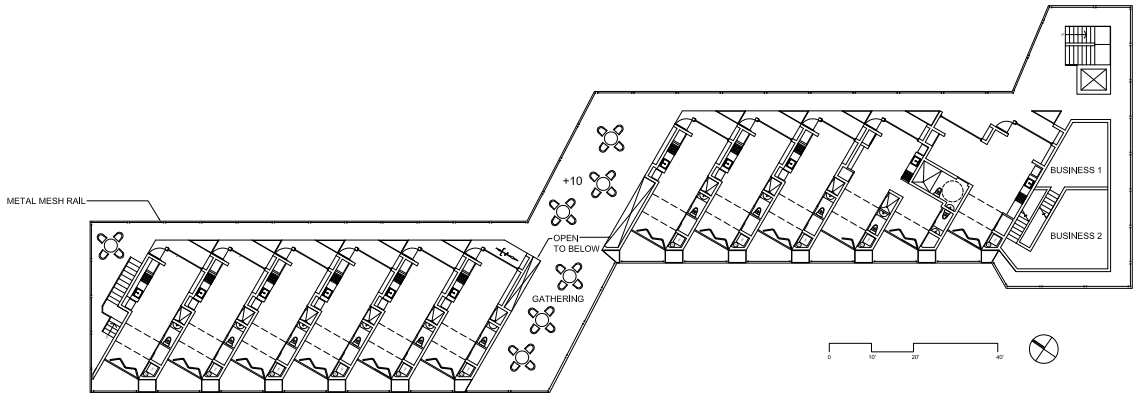
Walk-up 1 Floor Plans



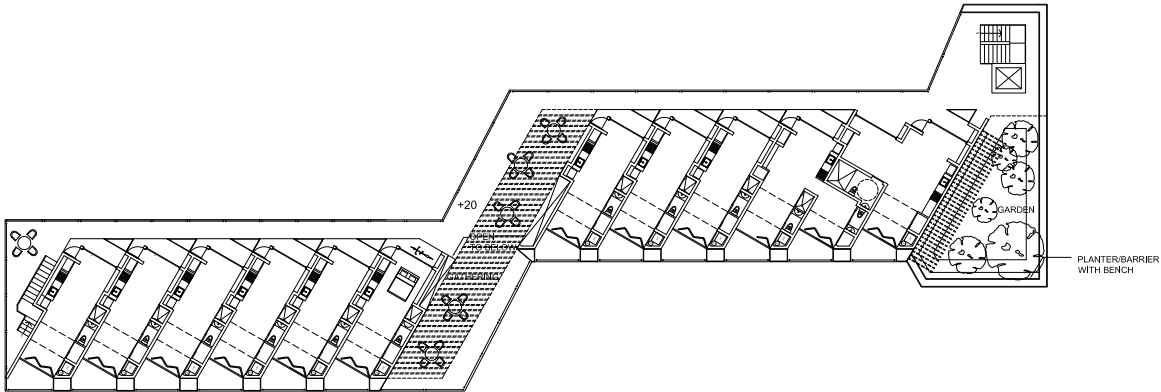
BASEMENT



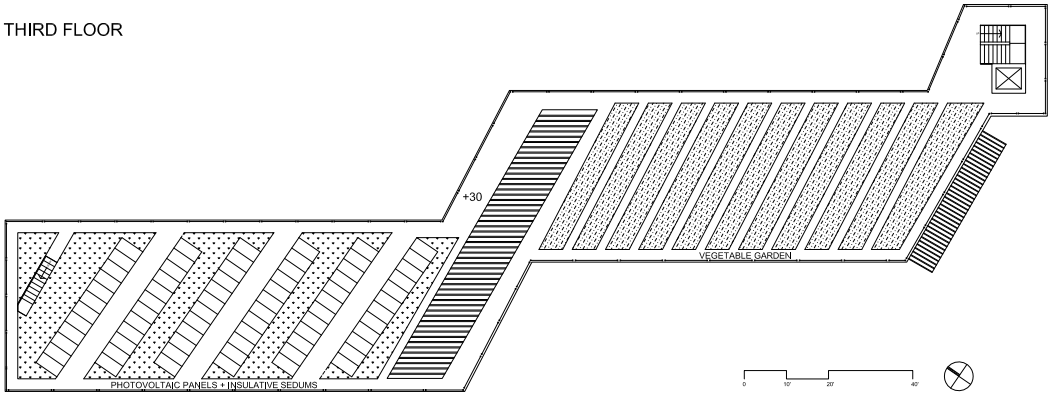
FIRST FLOOR



SECOND FLOOR

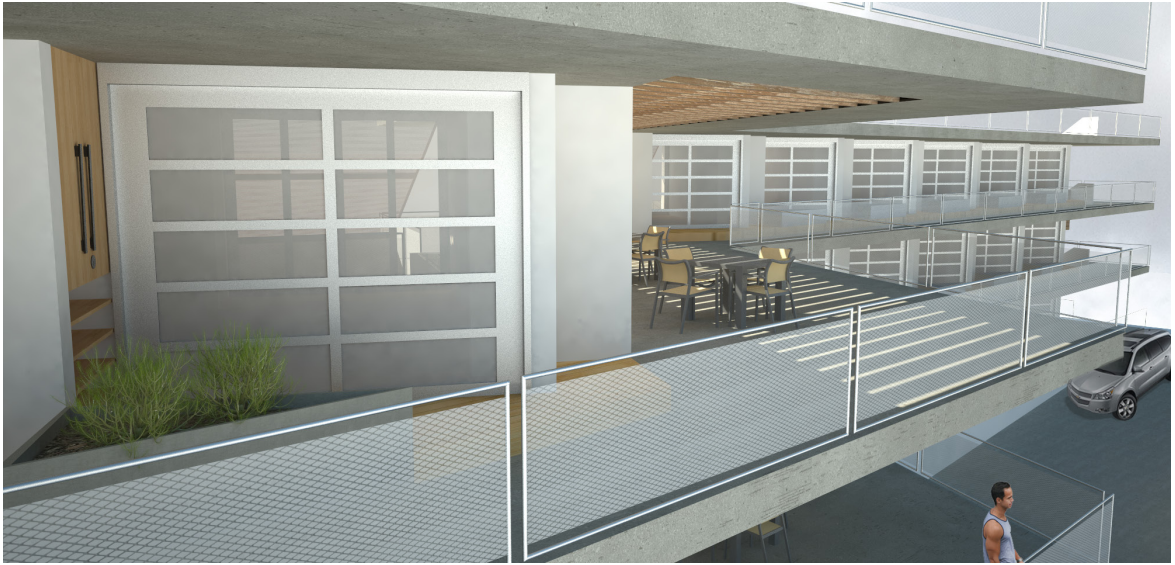


THIRD FLOOR

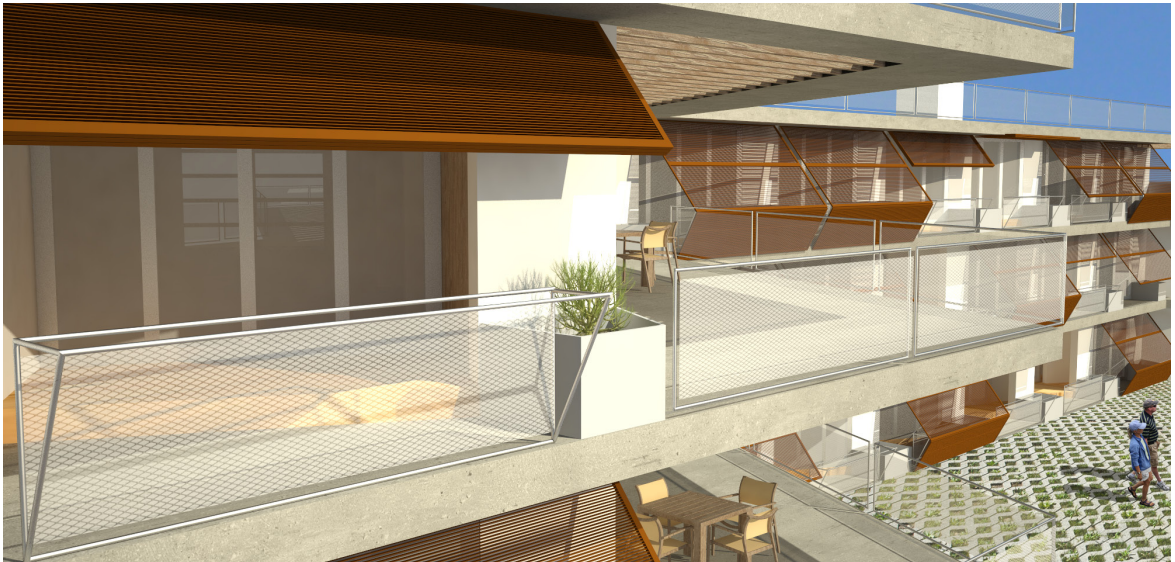
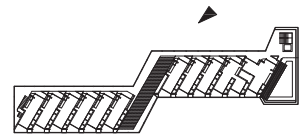


ROOF

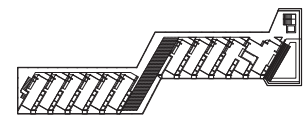




Exterior render of unit entrances and third floor gathering space



Exterior render of unit outdoor space and third floor gathering space



## Walk-up 1 Unit

There are three unit types for the building. The majority of the building consists of Unit A which is the standard unit. Unit B is a slightly larger unit consisting of two private outdoor spaces, and Unit C is an ADA accessible unit incorporating larger bathroom spaces and no entrance step. Each floor has one of each Unit B and C.

The standard unit consists of four types of spaces varying in degree of privacy. The largest space is the private interior space which compounds all functions with wall structure, allowing a large open space for occupants to arrange their living space according to their needs.

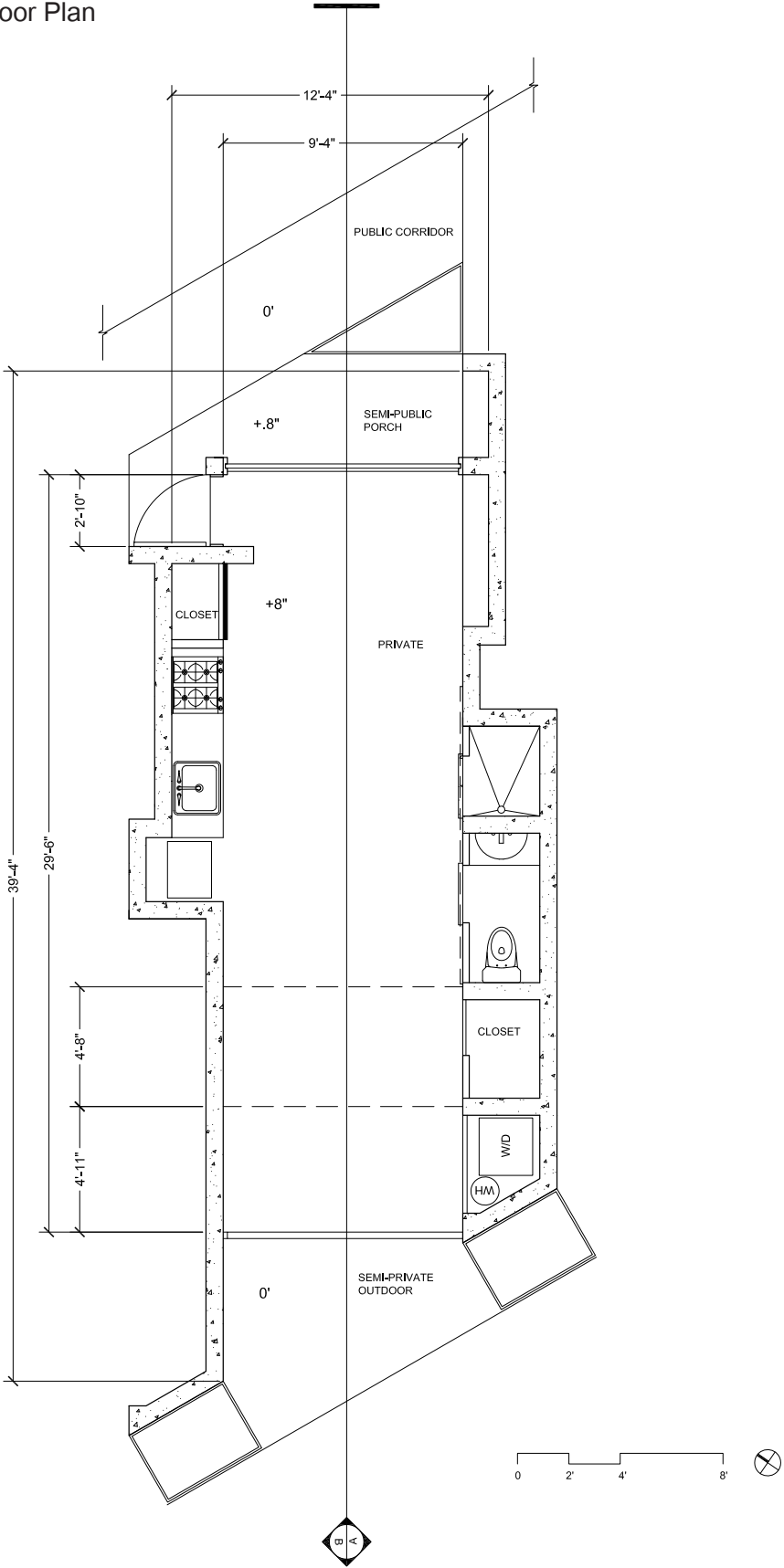
The semi-private outdoor space is at the back of the unit, which overlooks the park. Occupants have the option of adjusting their indoor and outdoor space with a moving door/wall at the back of the unit. It is connected to a track which runs parallel to the structural walls, changing the ratios of indoor and outdoor space. The door can lock to three different positions on the wall. A shading device is also incorporated into the design of the outdoor area. The device is divided into 3 pieces and is operated by a mechanical lever which can wind the device up or down. The three pieces allow the device to shade the unit at varying degrees.

The semi-public porch space is at the front of the unit, which is also where a front door and a garage door is located. There is a typical front door entrance, however the garage door functions as a larger entrance providing for gathering guests or when moving large objects in or out of the unit. The garage door also functions as a movable wall and window allowing for an abundance of fresh air and ventilation into the space. A rolling screen system is attached to the walls to add privacy to the interior space when necessary. The last of the four spaces is the public corridor that all residents share.

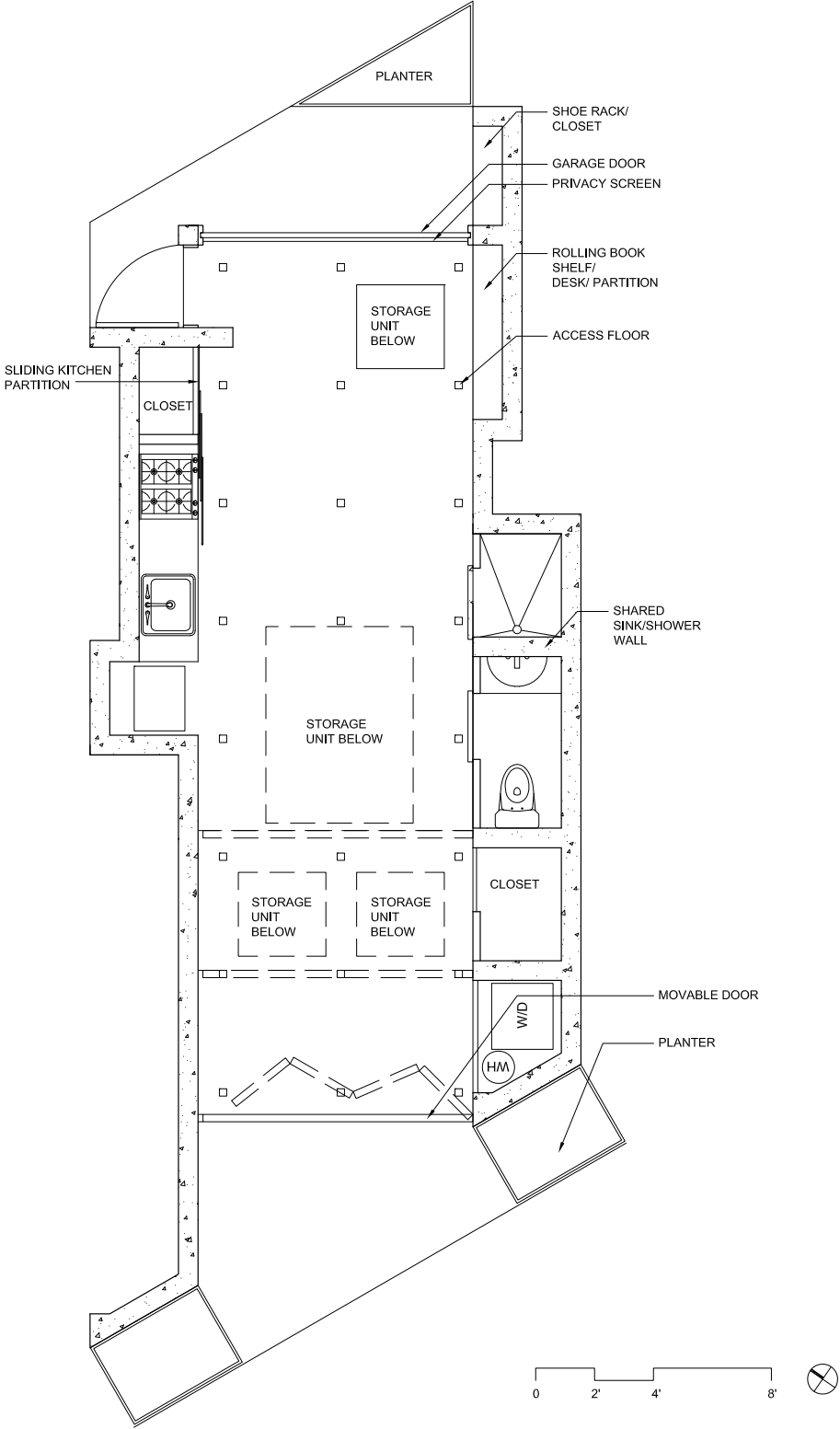
Other flexible components of the unit are found in the bathroom, kitchen, floor, and furniture. The bathroom is divided into two spaces: a toilet/sink area and a shower area. The sink and shower share a pipe and draining wall. The kitchen incorporates sliding partitions to hide itself from the main space when not used. A bookshelf is tucked into the wall but sits on wheels, allowing it to move throughout the space, acting as a partition. The floor is raised allowing storage to exist below (refer to page 89). The large storage unit is capable of fitting a standard sized bed in it, giving occupants the choice of sleeping on the floor and storing their bed when not in use.

To increase flexibility, occupants will have another option of expanding their living space. If a unit above or below an occupant's unit is vacant, he or she has the option of buying out the unit and connecting it to their own. By re-arranging the kitchen and bathroom space, a stair may be added leading up or down to the second unit. This would put a half bath below the stairs with the kitchen relocated to where the bathroom originally was. This is an ideal solution for growing families.

Walk-up 1 Unit Floor Plan



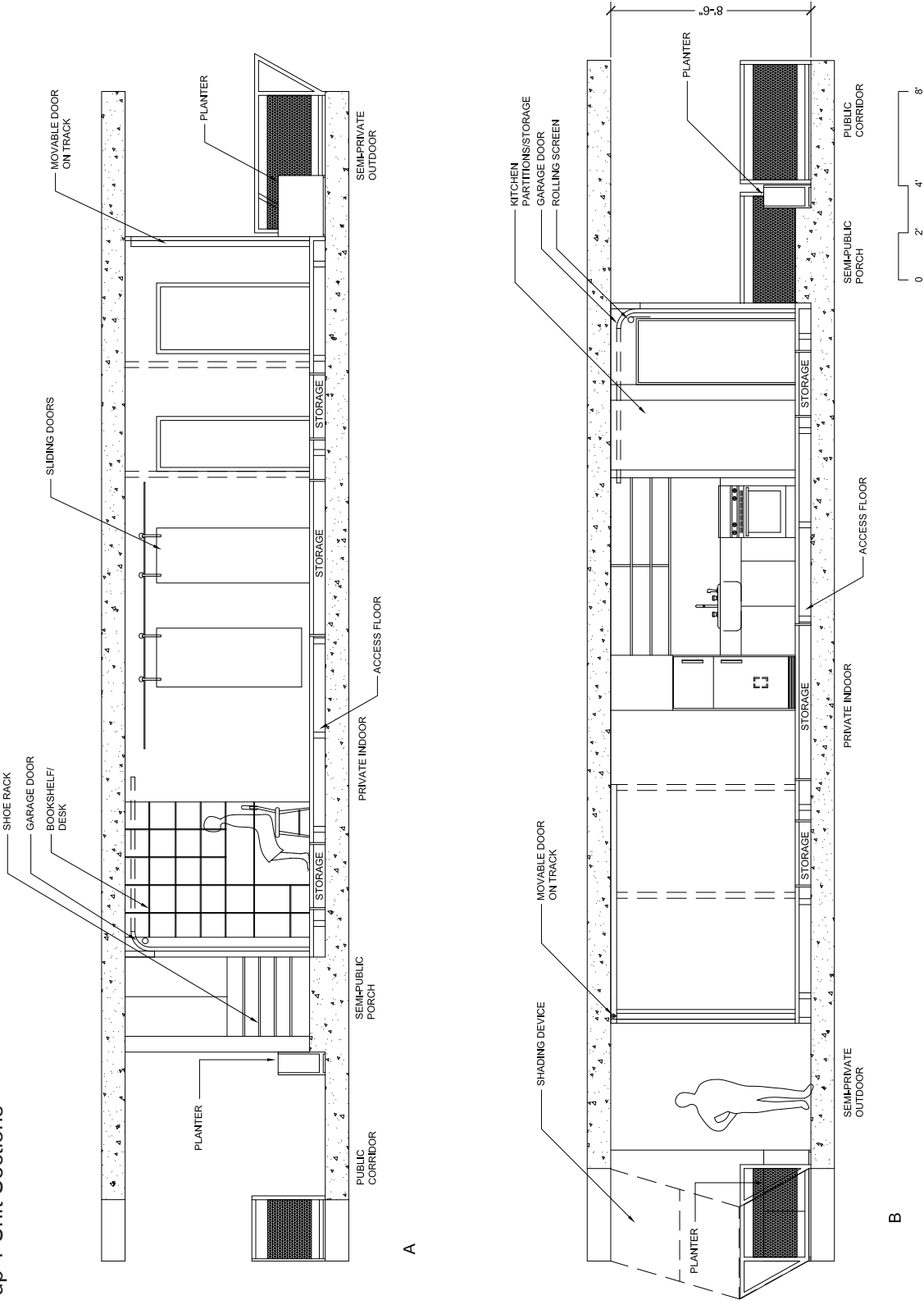
Walk-up 1 Unit Floor Plan of Components



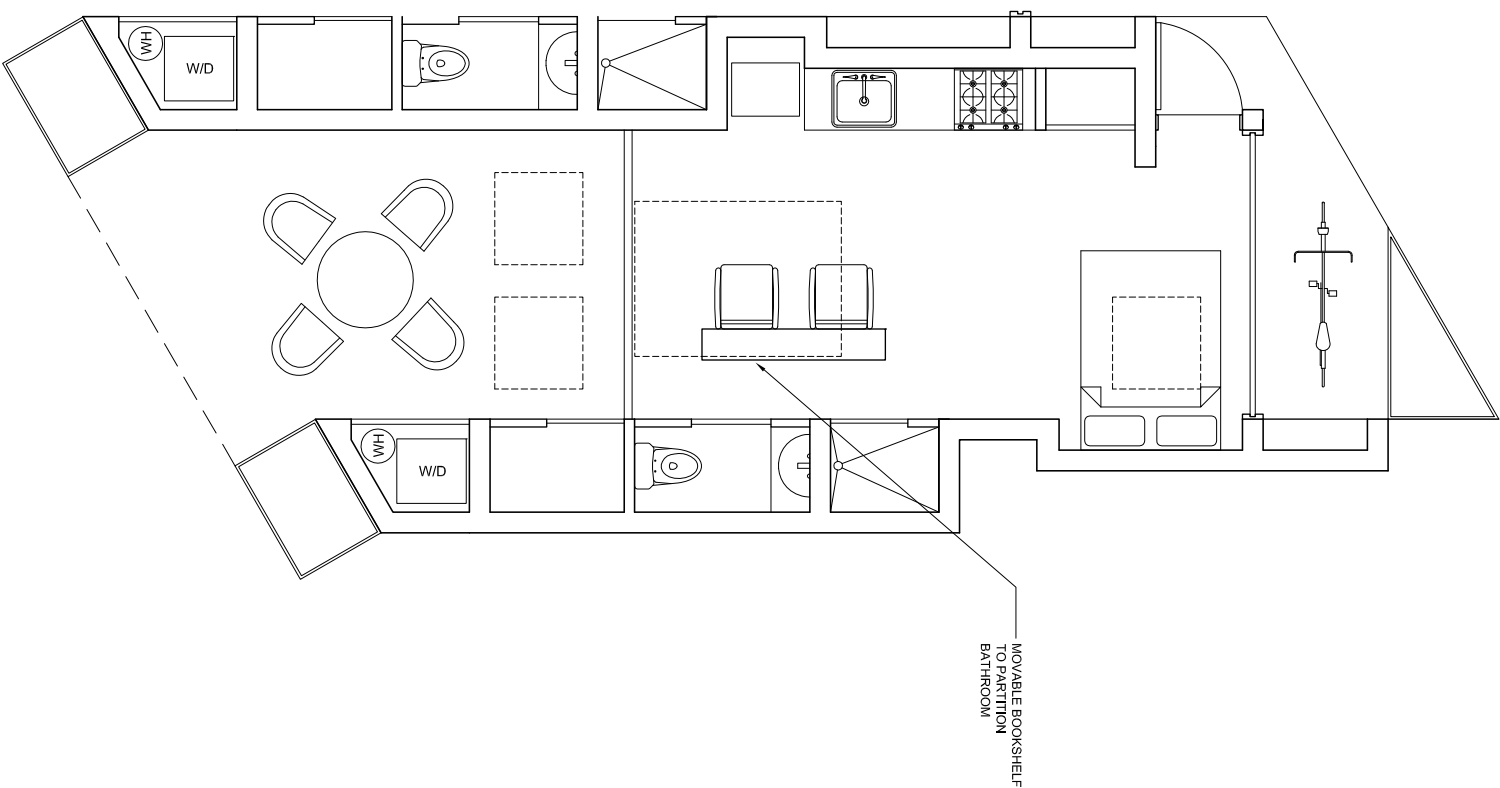
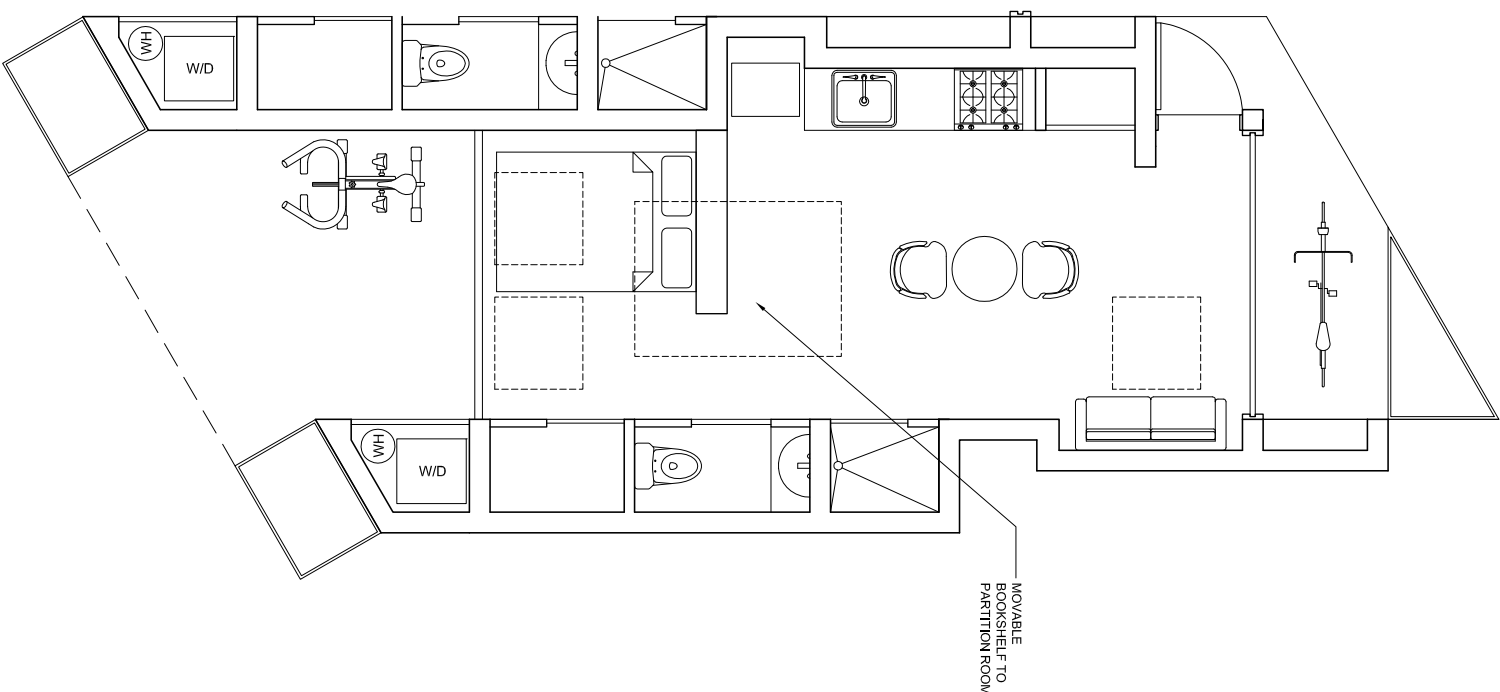
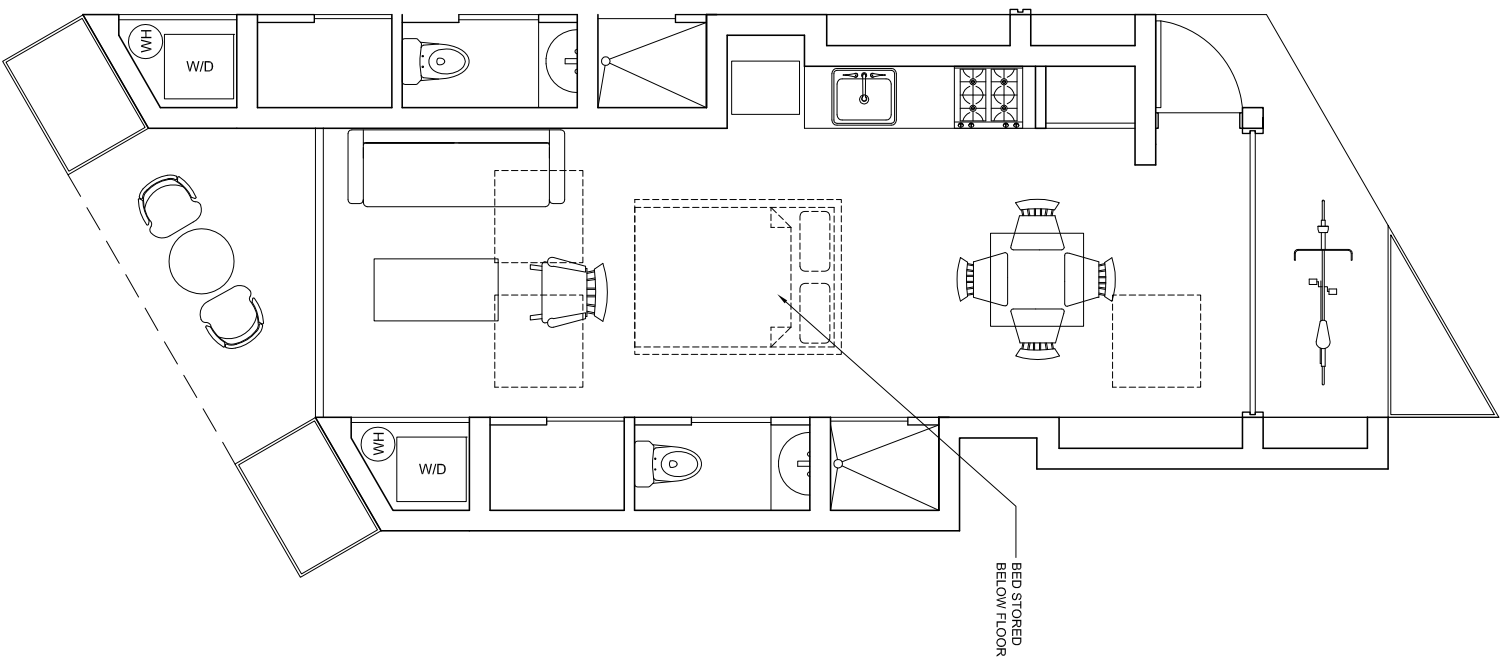


Plan perspective of unit

Walk-up 1 Unit Sections

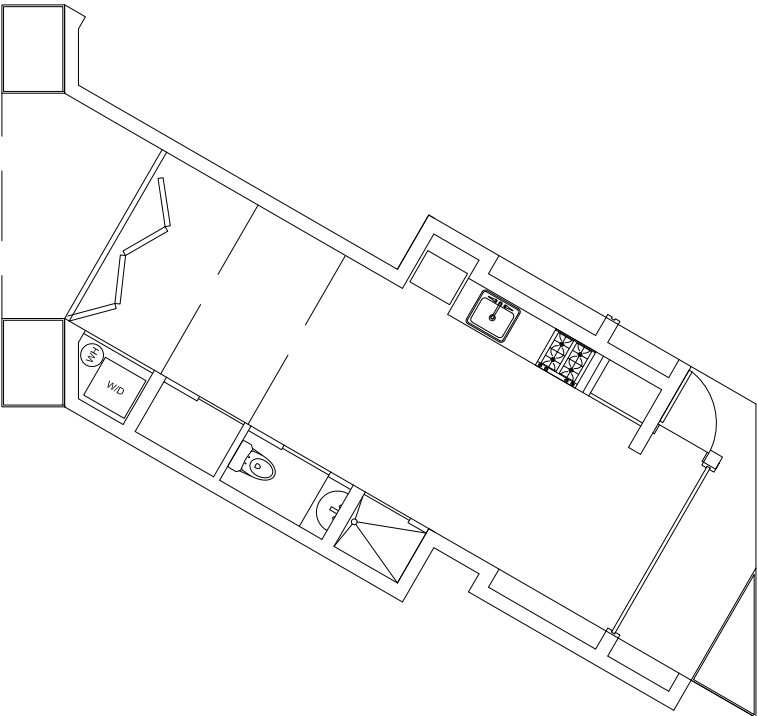


Standard Unit Space Manipulation





Unit Type



1-2 PEOPLE

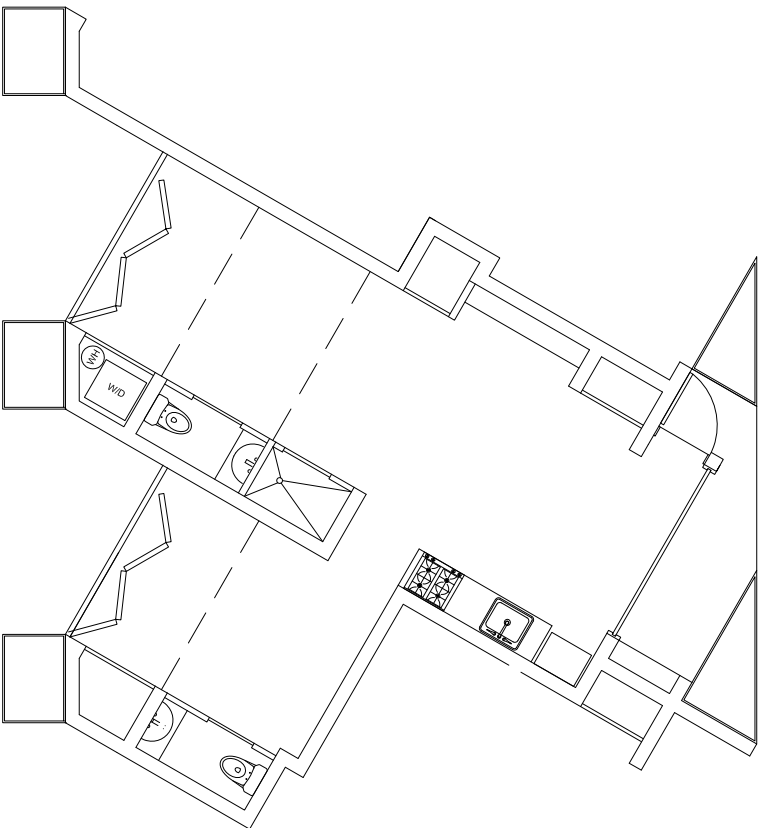
1 BATH

TOTAL 491 SF

INDOOR RANGE: 217-365 SF

OUTDOOR RANGE: 105-200 SF

UNIT A



2-3 PEOPLE

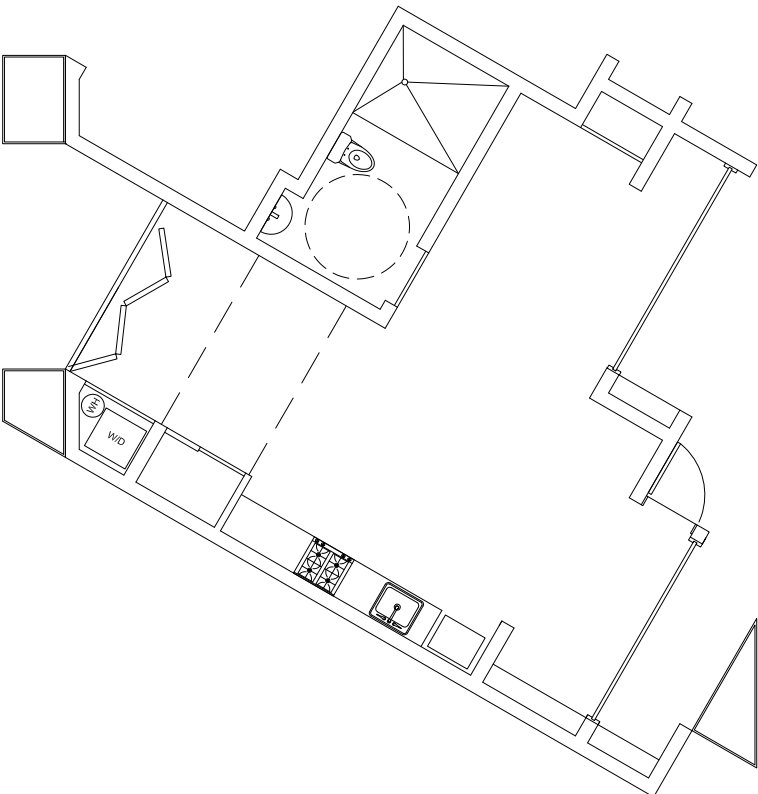
1.5 BATH

TOTAL 744 SF

INDOOR RANGE: 344-549 SF

OUTDOOR RANGE: 167-318 SF

UNIT B



ADA ACCESSIBLE

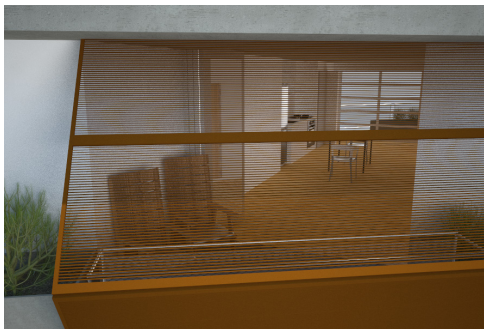
1 BATH

TOTAL 785 SF

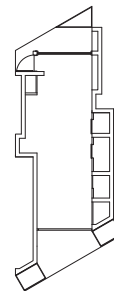
INDOOR RANGE: 483-805 SF

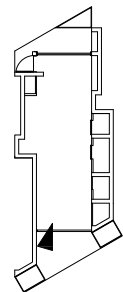
OUTDOOR RANGE: 170-284 SF

UNIT C



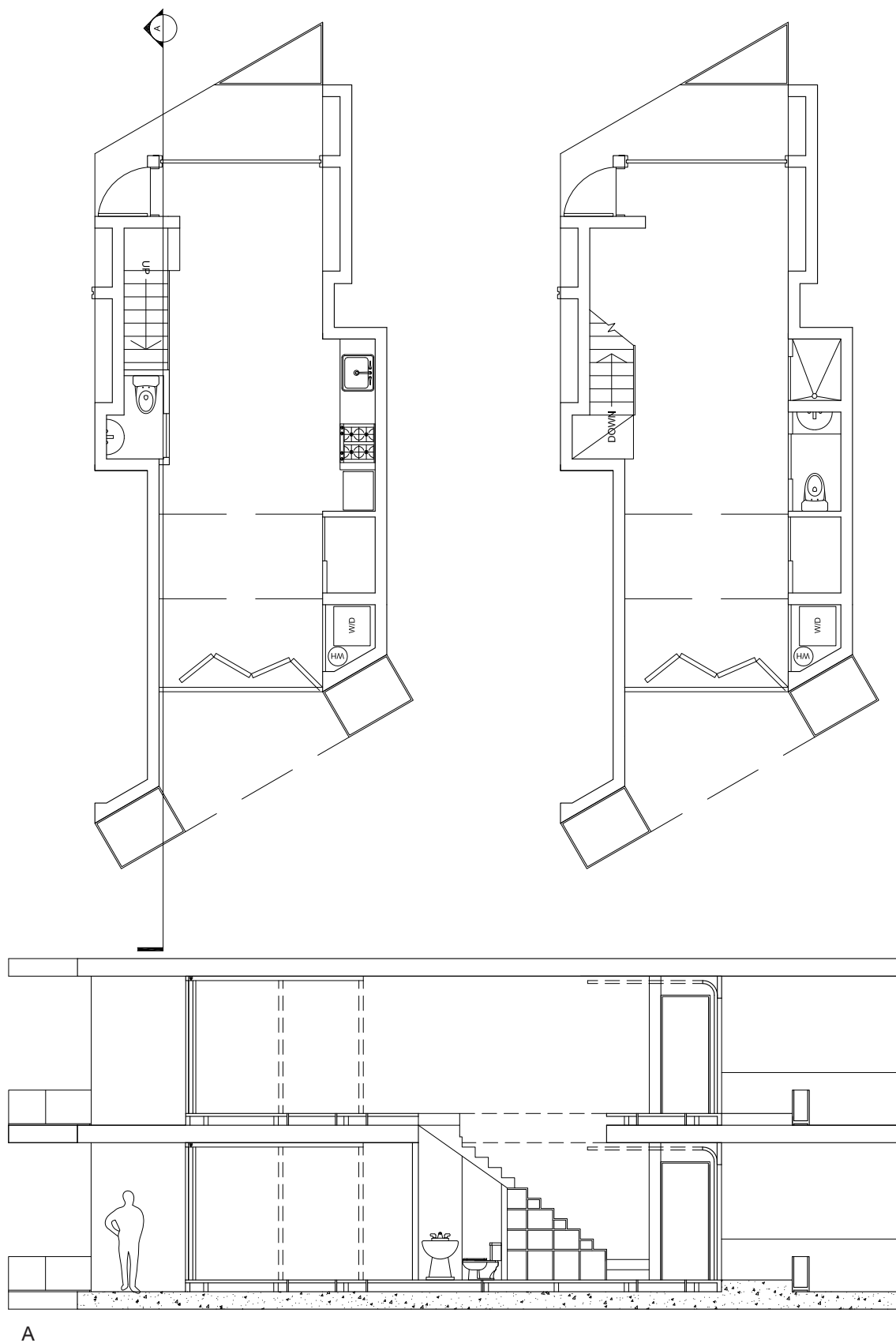
Movable door and shading system at back of unit





Movable bookshelf/partition

## Two Story Option





Section render of Two Story Option

## Walk-up 2

This concept hybridizes the walk-up, a small house, and a shop house. It is laid out in a similar fashion to a townhouse. Units share a structural wall and are arranged in two continuous rows, emphasizing density and efficiency. Based off of the typical walk-up, the external staircase and public access corridor were removed, internalizing the staircase to improve the function and quality of the unit. It takes from the walk-up typology, the efficient use of space and compactness.

The walk-ups are laid out in two linear rows reaching the property line. These two rows create a semi-private garden space for the building. The units are angled at 30 degrees to direct views toward the semi-private garden and park. Trees and plants are added for shade and privacy. Two retail spaces are located at the street front, acting as a visual and sound barrier for the units and privatizing the garden space behind.

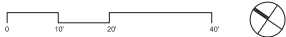
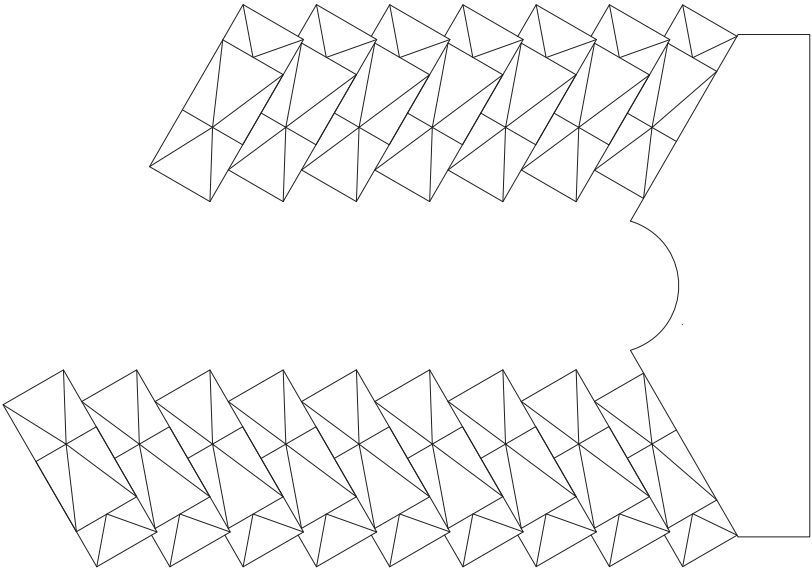
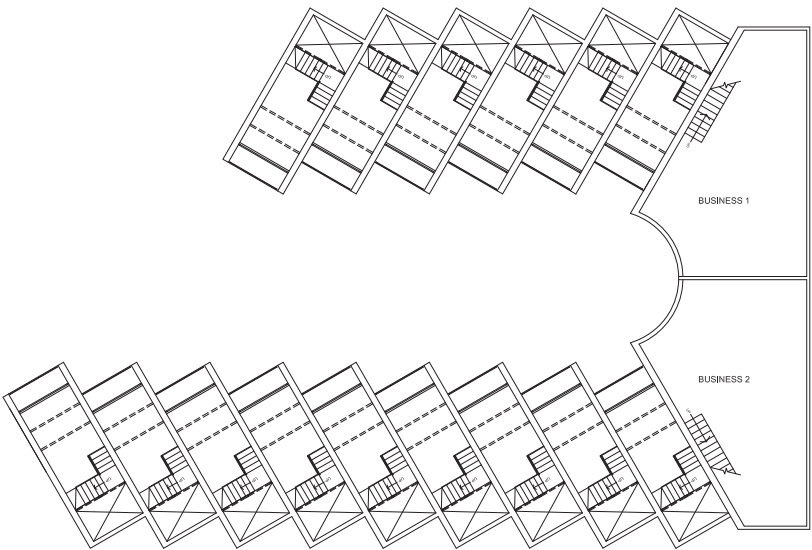
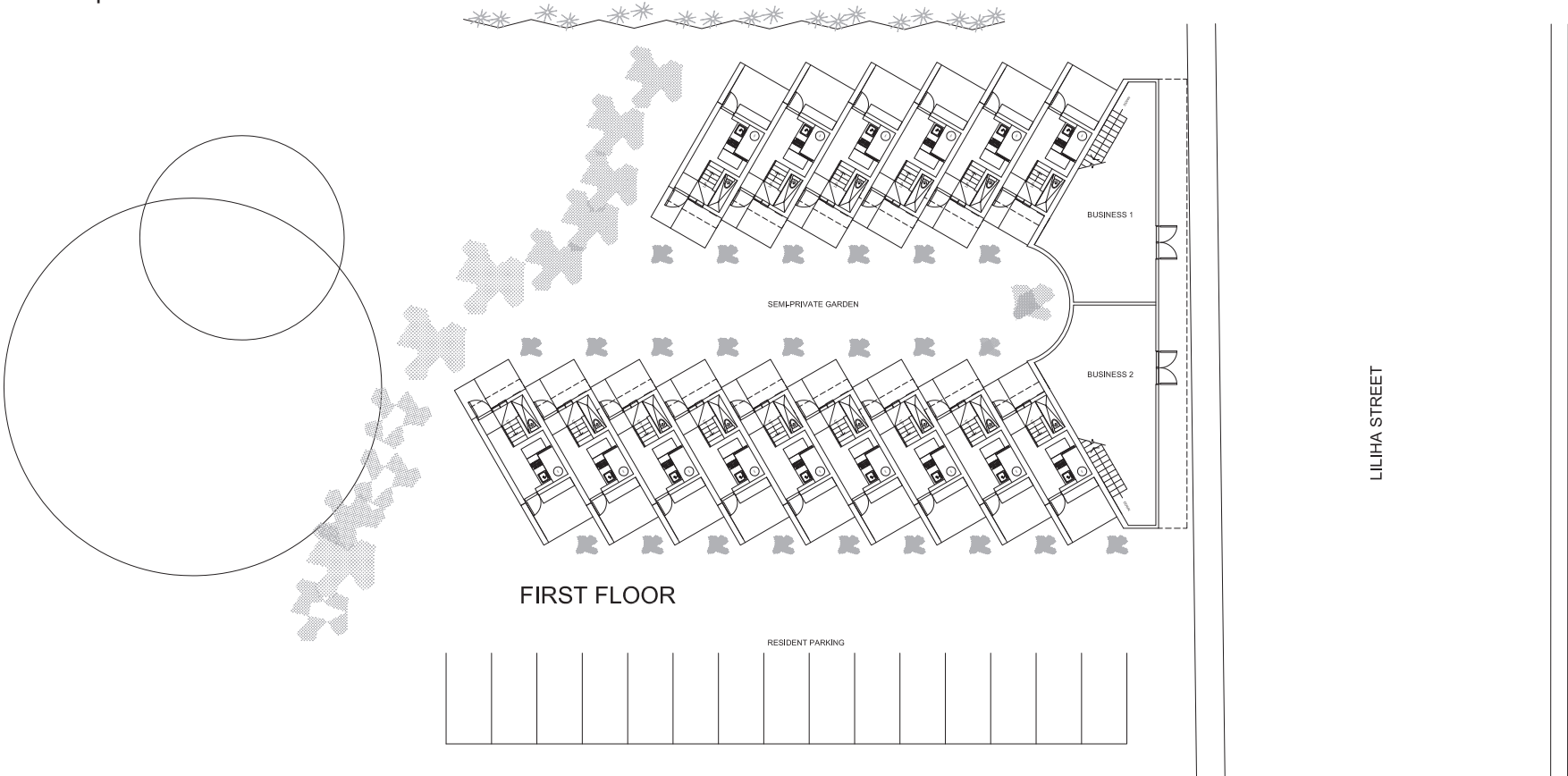
At the front of the units, there is a small porch space and entrance. A limited amount of parking is located southwest of the building for those who choose to have a car. However ample space at the front porch is available for parking bicycles and other alternative means of transportation. It is not expected that many of the occupants will own a car.

The structure consists of concrete load bearing walls dividing units and a secondary steel stud structure for perpendicular and interior walls. There is a wooden deck at the back of each unit and a vertical planting wall, also at the back façade which faces the semi-private garden.

These units are intended to be rented out by the church that owns the property it is sited on. By densifying this lot, it will add value to the neighborhood and additional revenue for the church. It is intended as a less permanent option of housing for single people or couples. As Liliha is relatively close to the University of Hawaii at Manoa (refer to page 117) and several other small colleges within Honolulu, it would be a viable option of housing for students.



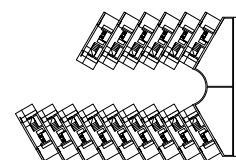
Walk-up 2 Floor Plans



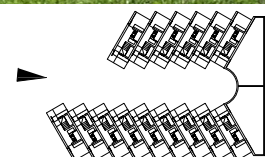




Exterior render of entrance to units



Exterior render of semi-private garden space



## Walk-up 2 Unit

This unit focuses on the staircase. It utilizes the staircase as a means to get from one level to the next but also programs landings and stairs to compound functions, allowing the greatest use of space. Bathroom, study, living, kitchen, bedroom, and private outdoor space are all situated at different levels of the unit. Stairs also produce a secondary function of storage space.

In order to maximize spatial efficiency, the bathroom was compounded into one singular space which houses a shower and a toilet. The toilet also functions as a sink where one flush will produce a clean flow of water out of a faucet before it fills the tank (refer to page 86).

A stair /drawer combination (refer to page 88) can be found within the stair leading to the 1.5 floor. The stair leading up to the second floor incorporates built in shelving within the wall below. This provides additional shelving for the kitchen, and storage for the outdoor porch to store shoes and larger miscellaneous goods. Additional storage is also located at the bottom floor which houses the water heater.

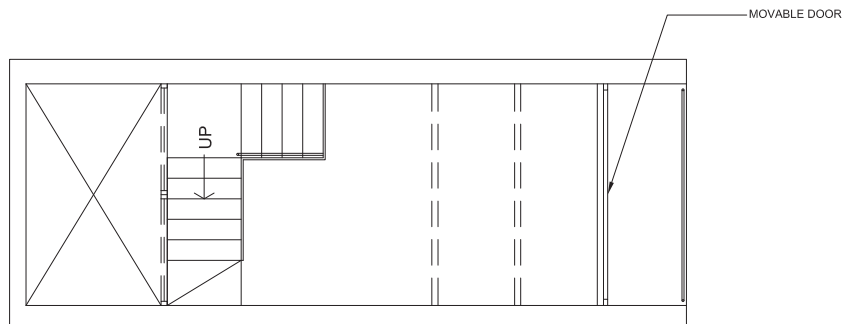
The landing before the 1.5 floor can be used as a study. A desk space is built into the wall allowing the desk to extend or retract. Above the desk is added storage space.

Although the kitchen is compact, it has a variety of different mechanisms which make it very functional. Besides the compartmental storage next to the sink, there is added storage at the front of counter, ideal for dishes. Additional movable counter space is located next to the fixed counter. It can be pulled out when needed. This movable counter can transform into a dining counter with seats built in.

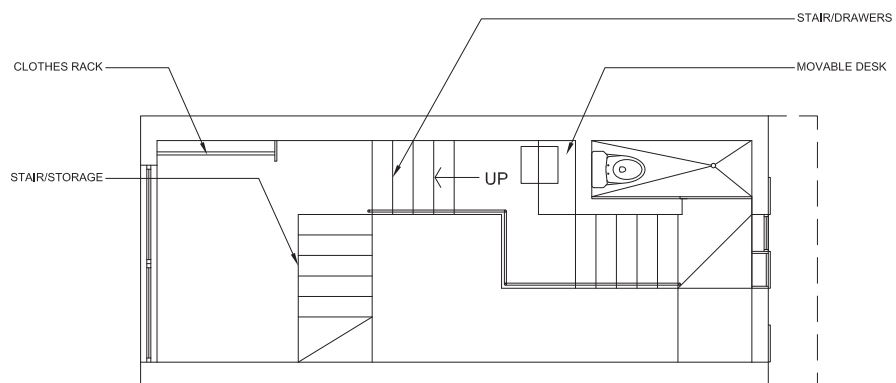
The second floor houses no functions. This allows the user flexibility to furnish the space as they desire. All functions within the house are kept at the bottom floor. The 1.5 floor acts similarly to the second floor. It is intended to be a bedroom however can also act as a living space. A movable door is located at the second floor, which functions the same as the backdoor in Walk-up 1's unit (refer to page 150).

There are three types of outdoor spaces for the occupants, varying in degree of privacy. The semi-private porch is located at the front of the unit, the semi-private garden is located at the back of the unit, and the private outdoor space is located at the second floor. Another vertical garden is located on the face of the back of the units giving occupants the option of growing herbs and other small plants.

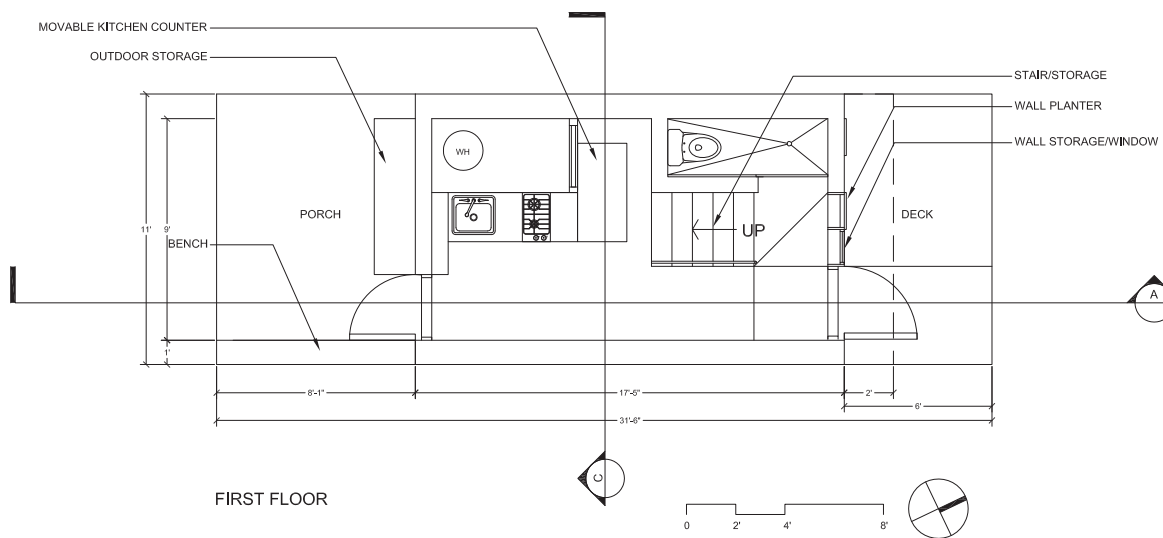
## Walk-up 2 Unit Floor Plans



SECOND FLOOR



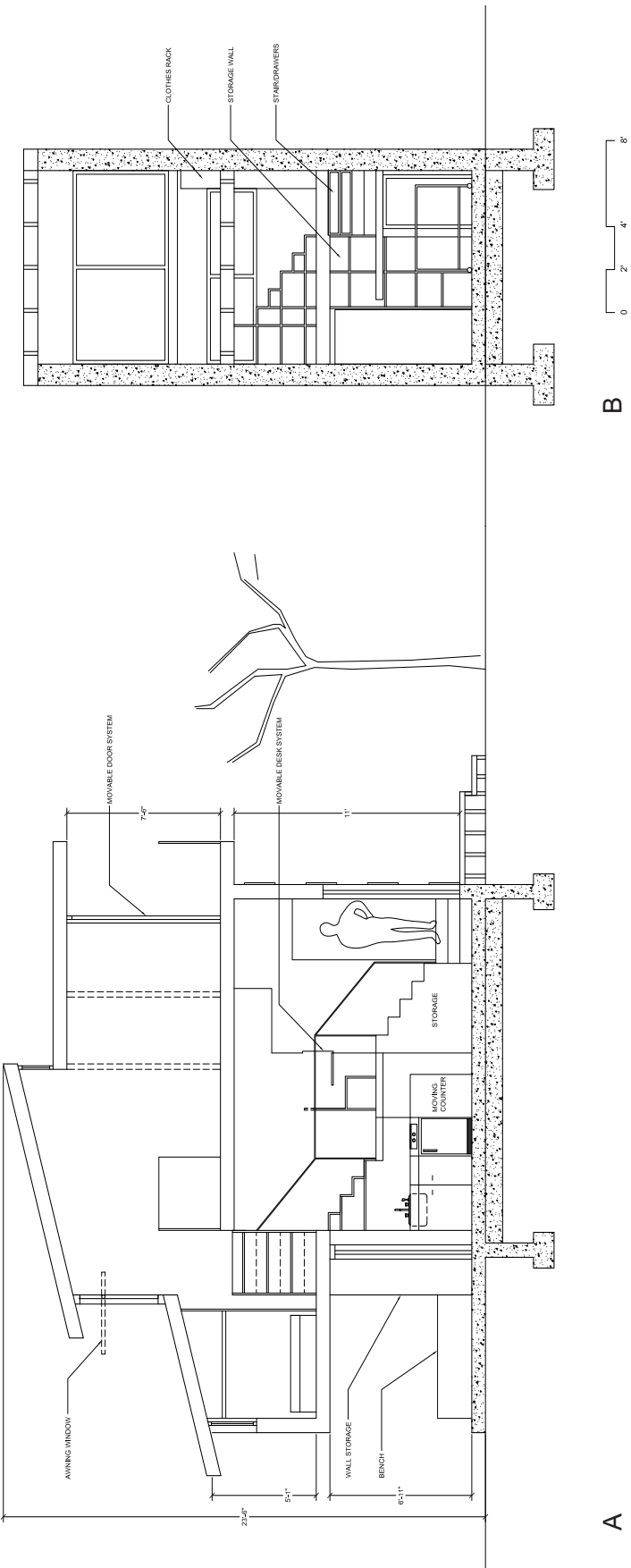
1.5 FLOOR



FIRST FLOOR

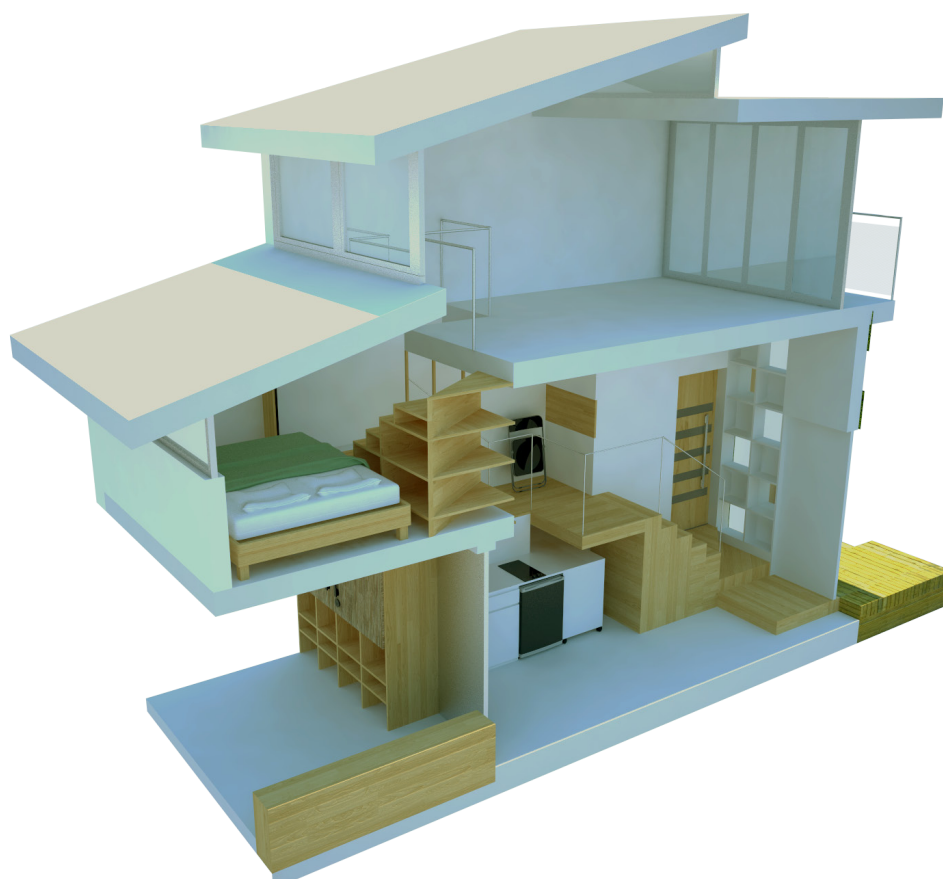
1-2 PEOPLE  
1 BATH  
TOTAL 520 SF  
INDOOR RANGE: 295-345 SF  
OUTDOOR RANGE: 170-230 SF

Walk-up 2 Unit Sections

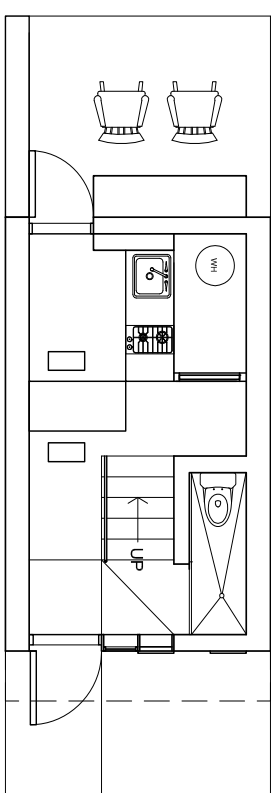
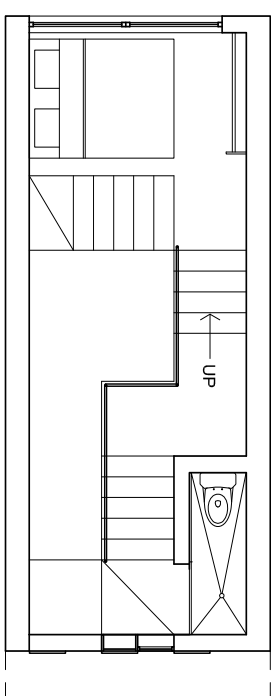
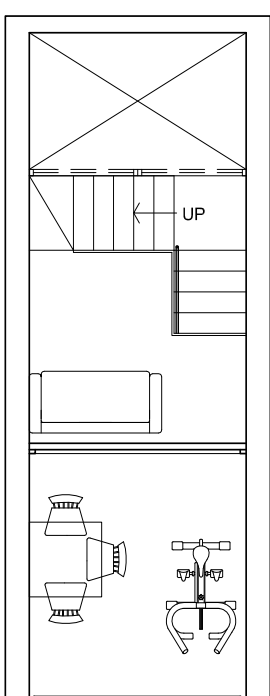
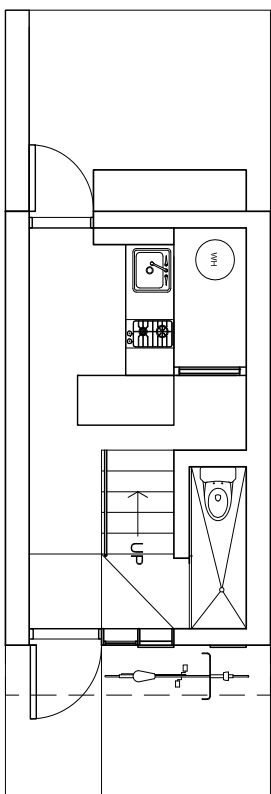
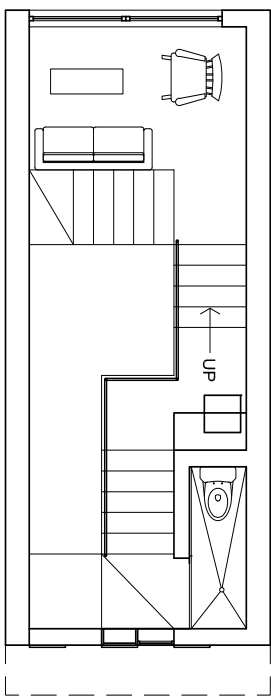
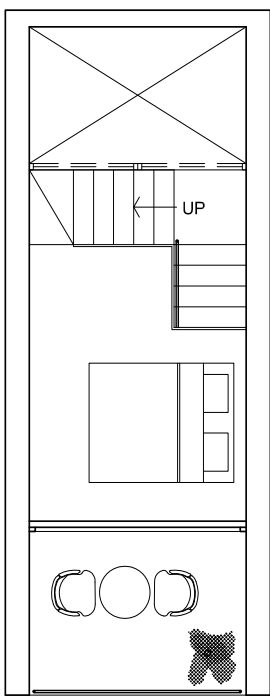
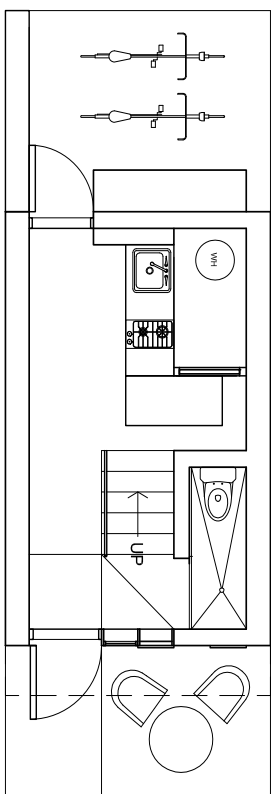
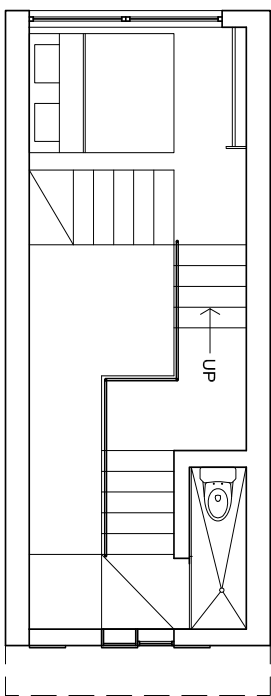
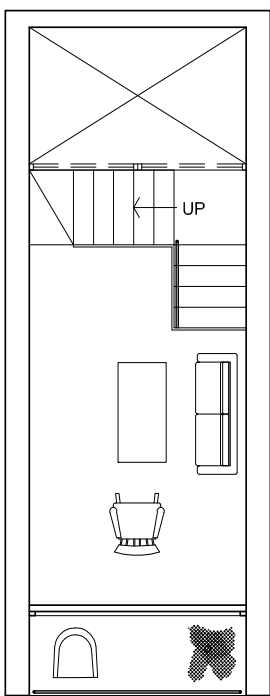




Section perspective of unit 1 interior



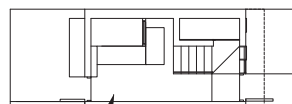
Walk-up 2 Unit Space Manipulations







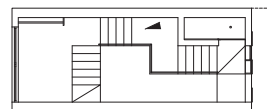
Renders of movable and transformable kitchen counter/dining table







Renders of 1.5 Floor bedroom/living space



## Corner Building and Market

The corner building incorporates a variety of different community functions. The existing Longs Drugs and Liliha Bakery are kept on site. Added to the site are new public parking types, a small grocery, an open market space, small restaurants, retail and office space, food truck stalls, and a café. This is intended to promote new behaviors throughout the neighborhood, providing spaces for Liliha residents to gather and inviting people outside of the neighborhood, in. This will encourage the Liliha neighborhood to be less of a transitional corridor and more of a destination.

Liliha Bakery is now split into two levels. The bakery display and diner are located at the ground floor for street frontage and easy access for customers. The bakery service is located within the basement. There are service elevators and stairs connecting these two spaces. Skylights and vents are open to the ground floor providing workers in the basement with fresh air and natural light. These skylights are also intended to display the baking and preparation system for pedestrians, adding delightful sights and smells to the market.

Longs Drugs is also split into two levels and is now connected to a small grocery store which can provide fresh produce to those living in the area. Within the basement is the storage area and service. Keeping Longs Drugs in its original location is most practical, as it can continue to act as a marker for the corner.

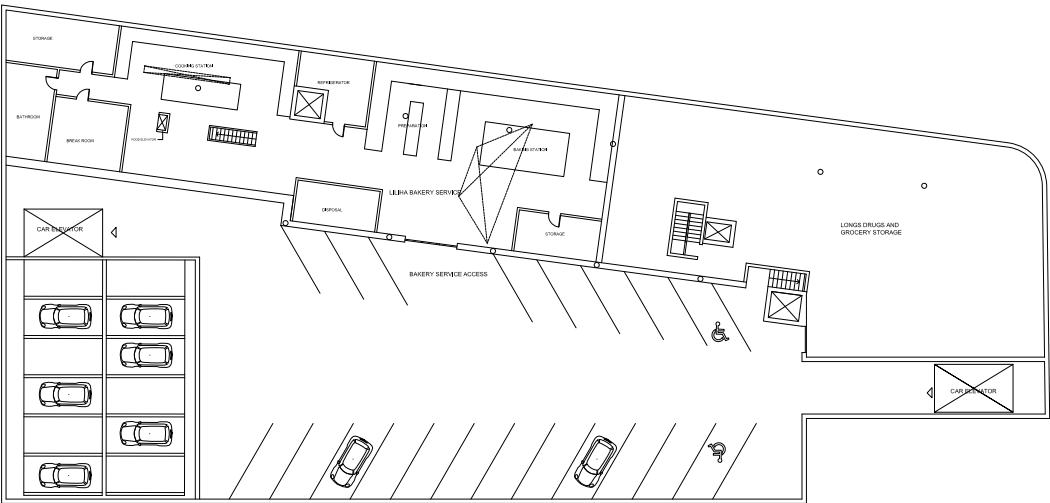
There are two types of public parking systems within this vicinity. The first parking system is a vertical tower parking. There are a total of 96 stalls within this system of eight car levels. Entrance to this parking system is located on Aipaako Street. It is intended for people who plan to visit Liliha for a long period of time or when capacity of this corner site is high. The second parking system is located in the basement of the building. It utilizes car elevators to enter and exit, eliminated the need for ramps which take up a great deal of square footage. Entrance to this parking lot is located on Liliha Street, and the exit is located on Aipaako Street. There are 19 stalls available, including service areas for delivery to the Bakery, Longs Drugs, and the grocery.

Located on the second floor are four compact retail spaces, two office spaces, bathrooms, and a café with seating arranged outdoors. A large stair leads up to these spaces and functions as additional seating for people frequenting the area. A wall on the northwest side hides the vertical parking from the

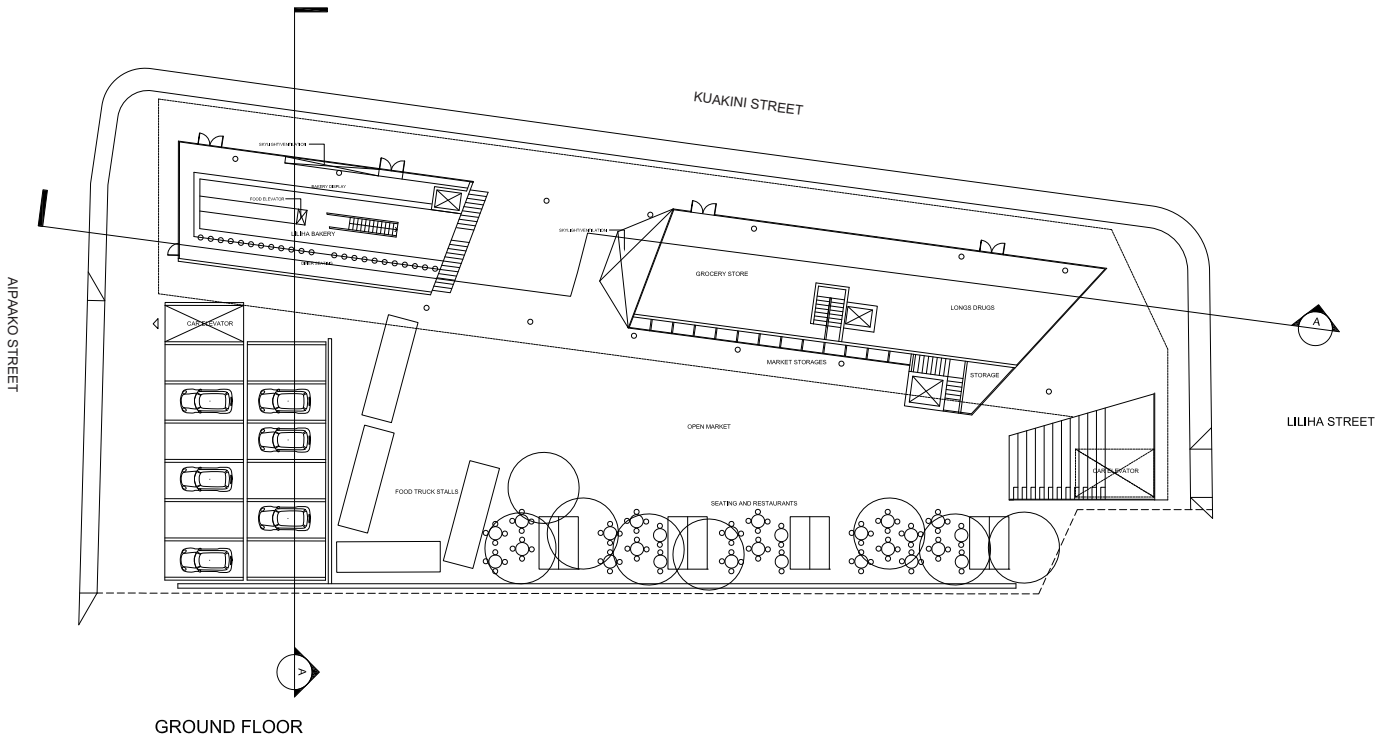
open market. This wall could also be used for movies or presentations to be projected off of, creating a stage-like area for different events.

Finally, the open market is central to the vicinity. Pedestrian access to it is from the corner of Kuakini and Liliha Street and at Kuakini Street, between Liliha Bakery and the grocery store. This space can hold a variety of different events, including farmers markets, movie nights, the annual "I love Liliha" Festival (which in the past has been a block party sighted on Kuakini and Liliha Street), art shows, night markets, food tastings, and other events. The wall next to the public elevator houses storage units for vendors of the temporary markets, giving them the ability to store goods and their setup. The open market is meant to be versatile to give the neighborhood a new type of building which can promote new behaviors and interaction between people.

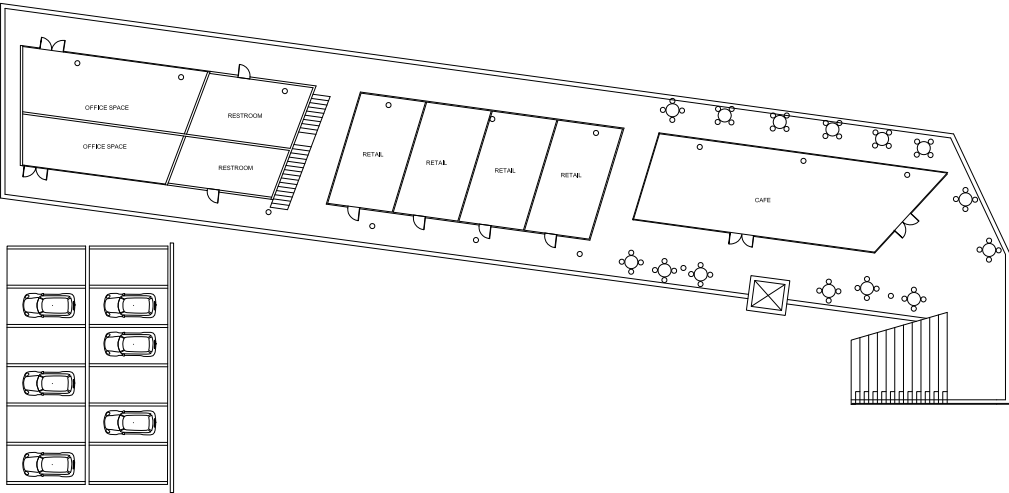
Corner Building Plans



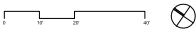
BASEMENT



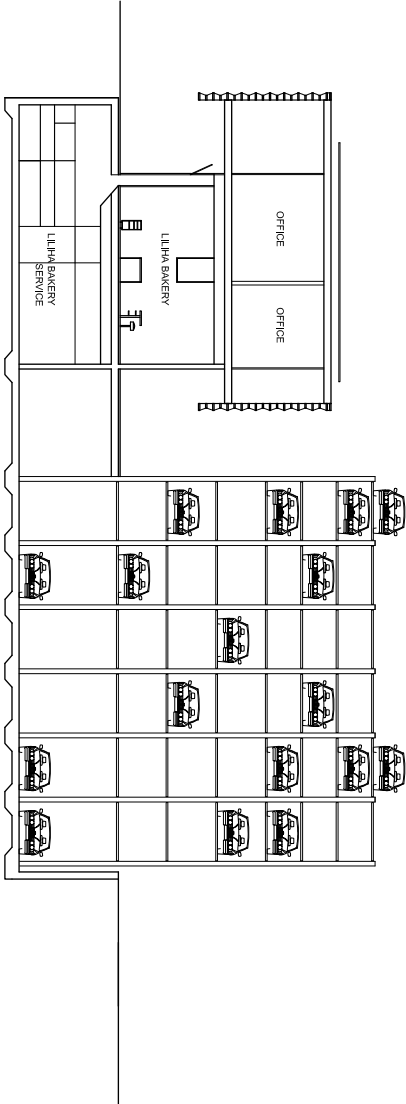
GROUND FLOOR



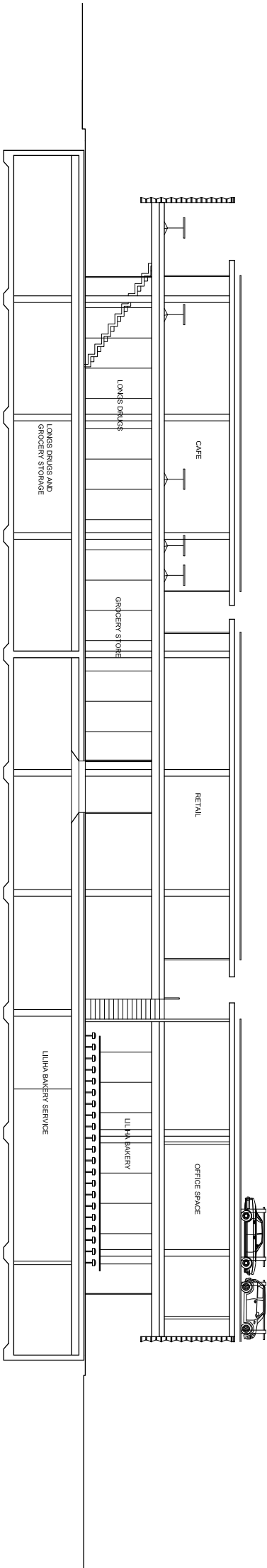
SECOND FLOOR



Corner Building Sections



A

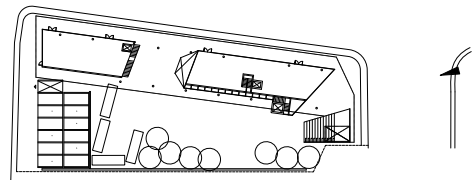


B





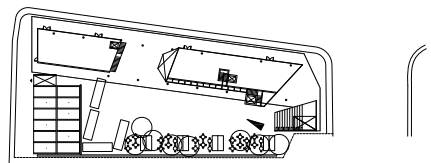
Exterior rendering of the Corner Building







Exterior rendering of market flexibility





## 10 Conclusion

Reconsidering the organization of a common housing typology in Honolulu is a continuation of the efficient and compact living model that is prevalent in this city. By recombining typological elements into a more versatile living space, and adding flexibility and occupant control unseen in previous typical dwellings, it will contribute to the development of compact living for the future. A better quality of life can be achieved when applying compact living to the urban and dwelling environment. These two components become complimentary to each other when compact living is applied to large and small scales to create a successful living environment.

With multiple housing issues surrounding our society today, a responsibility of ones needs should be considered. By compacting usable space and allowing it to be flexible and multi-functional, users will have more options to suit their individual styles and necessities and eliminating excess.

Studying the various compact methods other areas of the world employ has offered several innovative uses of domestic and urban spaces that Liliha and Honolulu can benefit from. These methods were studied and reconsidered to fit the project site. Liliha needs an array of new programs to reactivate the neighborhood. Liliha also needs to re-imagine some of its poorly used urban spaces that can be reconsidered for various events and gatherings. Flexible public spaces give communities more options in providing for their people. By doing so, a healthier, happier and efficient living environment is created.

Urban sprawl continues to rise but the issue can be mitigated by increasing density within the city. Providing new and attractive, yet responsible, compact housing solutions can bring people back into the city environment. By compacting the living environment, there is room for new programs to be introduced creating a flexible variety. The variety of programs will provoke new behaviors within, adjusting how people interact with each other and with the urban environment.

Providing conveniences is beneficial to everyday life and something that Liliha neighborhood can increase. Offering necessities like drug and grocery stores, and providing compact and versatile retail spaces, pocked size restaurants, user controlled living spaces, and a calendar of different temporary programs within the most recognizable corner of the neighborhood can be seen as a catalyst for development in Liliha and compact living for other areas of Hawaii.

Within the two walk-ups of the final design, giving occupants the greatest control over their living environments was essential. Retractable doors or moving walls and partitions, floor storages with hideable bed solutions, transformable counter spaces, compartmentalized staircases and compacted bathrooms give the occupant more options. Occupants are presented with the ability of transforming their spaces when needed. Flexible and multi-functional spaces are necessary in a small space, giving the user a larger range of adaptability within the space.

To reconsider how a common type of housing within the Liliha neighborhood can improve, the layers of use and change become the question and variables that provide guidelines for increasing the standards of living in a compact lifestyle. Walk-ups are increasingly valuable as the neighborhoods around Honolulu will continue to see growth and necessary development. Compact living will continue to be a healthy and efficient solution to the ongoing global challenges we face in the 21<sup>st</sup> century.









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